College of Agriculture

College of Agriculture

Overview

College of Agriculture

Purdue Agriculture is one of the world's leading colleges that offers food, agricultural, and natural resources programs. We train the next generation, who will drive innovation and discovery to reshape life sciences, biosecurity, the environment, agriculture, and the food system. Purdue Agriculture graduates are in great demand. During the past two decades, more than 90 percent of our graduates were employed or were enrolled in graduate or professional schools within three months of graduation.

Undergraduate Degree

Your undergraduate program will blend courses and experiences in your major with preparation in the life and physical sciences, written and oral communication, social sciences and humanities, multicultural awareness, and international understanding. Professional work experiences, leadership development, participation in student organizations, study abroad, and directed research can add to your professional development.

Graduate Degree

Your master's or doctoral program will be specialized and flexible to prepare you to meet your professional objectives. You'll find that we offer a growing number of multidisciplinary graduate degree programs, using directed experiences and courses from faculty members in one or more Purdue departments or colleges. Business and industry, government, and academic institutions throughout the world recruit our graduates for leading positions.

See www.ag.purdue.edu/oap.

Admissions

http://www.admissions.purdue.edu/majors/colleges.php?ClgCd=AGR

Admission to Teacher Education

Teacher Education Program Guidelines 2016-17

Advising

Department	Contact	Phone Number	Email
Agricultural and Biological Engineering	Nate Engelberth	765-494-3060	nengelbe@purdue.edu
Agricultural Economics	LeeAnn Williams	765-494-4201	Leewill@purdue.edu
Agronomy	Lee Schweitzer	765-494-4775	lschweitzer@purdue.edu
Animal Sciences	Ashley York	765-494-4843	ashleyyork@purdue.edu
Biochemistry	Sherry Pogranichniy	765-494-1612	spograni@purdue.edu
Botany and Plant Pathology	Tyson McFall	765-494-0352	tjmcfall@purdue.edu
Entomology	Jonathan Neal	765-494-4594	bugs@purdue.edu
Food Science	Allison Kingery	765-494-2766	foodsci@purdue.edu
Forestry and Natural Resources	J. Barny Dunning	765-494-3565	jdunning@purdue.edu
Horticulture and Landscape Architecture	Horticulture -Michael Dana Landscape Architecture - Rob Sovinski Sustainable Food & Farming Systems - Steve Hallett Turf Management & Science - Cale Bigelow	765-494-5923 765-494-1341 765-494-7649 765-494-4692	dana@purdue.edu sovinski@purdue.edu halletts@purdue.edu cbigelow@purdue.edu
Natural Resources and Environmental Sciences	John Graveel	765-494-4756	nres@purdue.edu
Preveterinary Medicine	Tim Kerr	765-494-8481	prevetinag@purdue.edu
Youth Development and Agricultural Education	Agricultural Education - B. Allen Talbert Agricultural Communication - Mark Tucker	765-494-8423	btalbert@purdue.edu matucker@purdue.edu

Department	Contact	Phone Number	Email
		765-494-8429	

Contact Information

College of Agriculture
615 West State Street
West Lafayette, IN 47907-2053
Email: exp@purdue.edu
Phone: 765-494-8470

College of Agriculture Administration

About Agricultural Administration

Purdue University's College of Agriculture is one of the world's leading colleges of agricultural, food, life, and natural resource sciences. As a land-grant institution, we are committed to preparing our students to make a difference, wherever their careers take them; stretching the frontiers of science to find solutions to some of our most pressing global challenges; and, through Purdue Extension and engagement programs, helping the people of Indiana, the nation and the world improve their lives and livelihoods.

Faculty

https://ag.purdue.edu/Pages/directory.aspx

Contact Information

College of Agriculture
615 West State Street
West Lafayette, IN 47907-2053
Email: exp@purdue.edu
Phone: 765-494-8470

Website: http://ag.purdue.edu/oap/Pages/default.aspx

Natural Resources and Environmental Science: Air Quality Concentration, BS

About the Program

Understand the interactions of living organisms and their relationships to soils, water, and air. Natural Resources and Environmental Science is an interdisciplinary science-based program with concentration areas in Air Quality, Environmental Policy Analysis and Economics, Land Resources, Water Quality, or a student-derived focus area. NRES graduates work for businesses, industries, non-profits, and governmental agencies. Others continue their education in environmental law, teaching, or working in research.

Concentrations include:

- Air Quality
- Emerging Environmental Challenges
- Environmental Policy and Analysis
- Land Resources
- Water Quality

Natural Resources and Environmental Science (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Natural Resources and Environmental Science: Air Quality include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (107 credits)

Required Major Courses (10 credits)

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Other Departmental /Program Course Requirements (97 credits)

(See Advising Resources)

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs,

internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 43100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (EAPS 42100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

EAPS 42100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (AGRY 43100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudo-adiabatic processes, hydrostatic stability, and air mass determination. Prior course work in introductory atmospheric science, second semester physics or thermodynamics is required. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density;

the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

EAPS 32000 - Physics Of Climate

Credit Hours: 3.00. Open to majors in the Schools of Science, Agriculture, and Engineering. To understand climate we describe and synthesize physical processes in the atmosphere and their coupling to the ocean, ice, and land. We quantitatively explore climatology with an equal balance of physical principles and scrutiny of available modern data. Topics include: visualization of atmospheric/land surface/oceanographic climatological data sets; theories of climate dynamics; and climate change. Beginning with radiative balance and simple energy balance models, the course progresses toward understanding the effects of radiative-convective forcing and rotation on the fluid envelopes. Analysis of data in an interactive computer-enabled environment is an important part of the course. By the end of this course, the student should know how the Earth System behaves at large scales and grasp the physical understandings of why. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 35700 - Fundamental Remote Sensing

Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Ecology Selective - Credit Hours: 3.00
- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 9.00
- Air Quality Selective - Credit Hours: 12.00
- Microeconomics Selective (satifies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (13 credits)

- Elective - Credit Hours: 13.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness

- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural

resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGRY 43100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (EAPS 42100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

EAPS 42100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (AGRY 43100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudo-adiabatic processes, hydrostatic stability, and air mass determination. Prior course work in introductory atmospheric science, second semester physics or thermodynamics is required. Typically offered Fall.

FNR 35700 - Fundamental Remote Sensing

Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 6.00
- Ecology Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

EAPS 32000 - Physics Of Climate

Credit Hours: 3.00. Open to majors in the Schools of Science, Agriculture, and Engineering. To understand climate we describe and synthesize physical processes in the atmosphere and their coupling to the ocean, ice, and land. We quantitatively explore

climatology with an equal balance of physical principles and scrutiny of available modern data. Topics include: visualization of atmospheric/land surface/oceanographic climatological data sets; theories of climate dynamics; and climate change. Beginning with radiative balance and simple energy balance models, the course progresses toward understanding the effects of radiative-convective forcing and rotation on the fluid envelopes. Analysis of data in an interactive computer-enabled environment is an important part of the course. By the end of this course, the student should know how the Earth System behaves at large scales and grasp the physical understandings of why. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

- Air Quality Concentration Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

- Air Quality concentration selective - Credit Hours: 3.00
- Biochemistry, biology, chemistry, mathematics, physics, or statistics selectives - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

- Air Quality Concentration Selectives - Credit Hours: 6.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 4.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Natural Resources and Environmental Science: Emerging Environmental Challenges Concentration, BS

About the Program

Understand the interactions of living organisms and their relationships to soils, water, and air. Natural Resources and Environmental Science is an interdisciplinary science-based program with concentration areas in Air Quality, Environmental Policy Analysis and Economics, Land Resources, Water Quality, or a student-derived focus area. NRES graduates work for businesses, industries, non-profits, and governmental agencies. Others continue their education in environmental law, teaching, or working in research.

Concentrations include:

- Air Quality
- Emerging Environmental Challenges
- Environmental Policy and Analysis
- Land Resources
- Water Quality

Natural Resources and Environmental Science (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Natural Resources and Environmental Science: Emerging Environmental Challenges include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (106 credits)

Required Major Courses (10 credits)

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and

water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Other Departmental /Program Course Requirements (96 credits)

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Ecology Selective - Credit Hours: 3.00
- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 9.00
- Emerging Environmental Challenges Selective - Credit Hours: 20.00
- Microeconomics Selective (satifies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative

and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (14 credits)

- Elective - Credit Hours: 14.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00

- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 6.00
- Emerging Environmental Challenges Selective - Credit Hours: 6.00
- Ecology Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

- Emerging Environmental Challenges Selective - Credit Hours: 6.00
- UCC Humanities Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 3.00
- Emerging Environmental Challenges Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

- Emerging Environmental Challenges Selective - Credit Hours: 5.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Natural Resources and Environmental Science: Environmental Policy and Analysis Concentration, BS

About the Program

Understand the interactions of living organisms and their relationships to soils, water, and air. Natural Resources and Environmental Science is an interdisciplinary science-based program with concentration areas in Air Quality, Environmental Policy Analysis and Economics, Land Resources, Water Quality, or a student-derived focus area. NRES graduates work for businesses, industries, non-profits, and governmental agencies. Others continue their education in environmental law, teaching, or working in research.

Concentrations include:

- Air Quality
- Emerging Environmental Challenges

- Environmental Policy and Analysis
- Land Resources
- Water Quality

Natural Resources and Environmental Science (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Natural Resources and Environmental Science: Environmental Policy & Analysis include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (10 credits)

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Other Departmental /Program Course Requirements (98 credits)

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Ecology Selective - Credit Hours: 3.00
- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 9.00
- Land Resources Selective - Credit Hours: 12.00
- Microeconomics Selective (satifies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 6.00
- Ecology Selective - Credit Hours: 3.00
- Land Resources - Credit Hours: 6.00

15 Credits

Spring 3rd Year

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Land Resources Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

- Land Resources Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Natural Resources and Environmental Science: Land Resources Concentration, BS

About the Program

Natural Resources and Environmental Science (multiple concentrations). Understand the interactions of living organisms and their relationships to soils, water, and air. Natural Resources and Environmental Science is an interdisciplinary science-based program with concentration areas in Air Quality, Environmental Policy Analysis and Economics, Land Resources, Water Quality, or a student-derived focus area. NRES graduates work for businesses, industries, non-profits, and governmental agencies. Others continue their education in environmental law, teaching, or working in research.

Concentrations include:

- Air Quality
- Emerging Environmental Challenges
- Environmental Policy and Analysis
- Land Resources
- Water Quality

Natural Resources and Environmental Science (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Natural Resources and Environmental Science: Land Resources include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 cedits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (10 credits)

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Other Departmental /Program Course Requirements (98 credits)

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating

Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Ecology Selective - Credit Hours: 3.00
- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 9.00
- Land Resources Selective - Credit Hours: 12.00
- Microeconomics Selective (satifies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding

- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural

resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 6.00
- Ecology Selective - Credit Hours: 3.00
- Land Resources Selective - Credit Hours: 6.00

15 Credits

Spring 3rd Year

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Land Resources Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

- Land Resources Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Natural Resources and Environmental Science: Water Quality Concentration, BS

About the Program

Understand the interactions of living organisms and their relationships to soils, water, and air. Natural Resources and Environmental Science is an interdisciplinary science-based program with concentration areas in Air Quality, Environmental Policy Analysis and Economics, Land Resources, Water Quality, or a student-derived focus area. NRES graduates work for businesses, industries, non-profits, and governmental agencies. Others continue their education in environmental law, teaching, or working in research.

Concentrations include:

- Air Quality
- Emerging Environmental Challenges
- Environmental Policy and Analysis
- Land Resources
- Water Quality

Natural Resources and Environmental Science (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Natural Resources and Environmental Science: Water Quality include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (120 credits)

Required Major Courses (10 credits)

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Other Departmental /Program Course Requirements (97 credits)

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CE 35500 - Engineering Environmental Sustainability

Credit Hours: 3.00. (EEE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. Typically offered Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

FNR 20100 - Marine Biology

Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Ecology Selective - Credits Hours: 3.00
- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 9.00
- Water Quality Selective - Credit Hours: 12.00
- Microeconomics Selective (satifies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (13 credits)

- Elective - Credit Hours: 13.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative

and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for

biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

NRES 20000 - Introduction To Environmental Careers

Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Ecology Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

CE 35500 - Engineering Environmental Sustainability

Credit Hours: 3.00. (EEE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. Typically offered Spring.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 6.00
- Ecology Selective - Credit Hours: 3.00
- Water Quality Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Water Quality Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

FNR 20100 - Marine Biology

Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.

- Biochemistry, Biology, Chemistry, Mathematics, Physics, or Statistics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Water Quality Concentration Selectives - Credit Hours: 6.00
- Electives - Credit Hours: 4.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Deans Scholar Certificate

Selection criteria:

- All students who enter Purdue University College of Agriculture as recipients of the Board of Trustees Scholarship are encouraged to apply to the Dean's Scholars Program as are others fulfilling the following criteria:
    - 3.8/4.0 High School GPA and 1800 SAT/ACT 27 and above
      OR
    - Valedictorian of high school
- First semester students will be asked to accept a Dean's Scholar status by May 15, 2015 and must accept the invitation prior to fall semester.
- Second semester freshmen, sophomores, and transfer students with 60 credits remaining at Purdue may apply if they have a GPA equal to or greater than 3.5. A written essay stating why the student is interested in being a Dean's Scholar is part of the formal application process. Review of applications will be administered by the Office of Academic Programs and the Departmental Honors Coordinator from the department in which the student is enrolled.

New requirements if you were admitted in Fall 2015:

- First semester students will enroll in AGR 29000 H01 - 1 credit.
- Each year a student is designated as a Dean's Scholar, the student is advised to complete three credit hours of honors courses. At graduation each Dean's Scholar will have a minimum of 12 credits of honors courses. Honors courses can be courses or sections of courses approved for honors credit by the College of Agriculture Curriculum and Student Relations Committee, a University Honors (HONR) course, a course with honors designation taught in another College (School) in the University, a 500- or 600-level course, or a regular course or section of a course in which a special honors project is required in addition to the regular course requirements. For a regular course or section of a regular course to receive a temporary designation as an honors course, the student must complete the Honors Contract Course form (For Honors Contract Course Procedure, click here). S/he will need to obtain the signature of Dr. Fernandez or his designee as the "Honors Unit Director."
- Students must complete at least 15 credits during regular academic year semesters in which they are resident at the West Lafayette campus.

- A Dean's Scholars Profile must be developed by the end of the student's first semester or by the end of the first semester after a student enters the Program. A Dean's Scholars Profile includes:
    - A working plan for meeting the 12 credit hours of honors courses.
    - A creative scholarly work such as a bachelor's thesis, laboratory project, or design project (3-6 credit hours); three credits of which may be used as part of the 12 credits of honors courses.
    - Annual participation in Dean's Scholars events. (Must participate in 8 events in order to receive the Dean's Scholars Designation at graduation. These events will be posted on our website soon.)
    - Participation in the Undergraduate Research Poster Symposium. The 2016 Poster Symposium will be held on April 12, 2016 in the Purdue Memorial Union Ballrooms. Students are also encouraged to present their project at a regional or national meeting and to publish their results, if appropriate.

Requirements if you were admitted for the Fall 2014 semester:

- AGR 10100 H01 for .5 credit
- 12 honors credits of course work by graduation
- Take 15 hours per semester
- Maintain a 3.25 cummulative GPA
- Develop a Dean's Scholars Profile by the end of their first semester
- Participate in a research project or scholarly work
- Participate in at least 8 Dean's Scholars events
- Participate in a poster symposium

Leadership Development Certificate

Program's Philosophy

The following philosophy about leadership was adopted by the College of Agriculture faculty on August 25, 2005. These beliefs serve as the foundation for the Leadership Development Certificate Program.

We believe that all students can and should exercise leadership. Leadership does not require formal authority or position and can be practiced by anyone interested in making a difference in his/her family, workplace, and community.

Leadership is a process of people working together toward common goals that bring about positive change. The effectiveness of leadership is based on trusting relationships. Through this exchange, people influence one another's thoughts and actions. By incorporating the diverse skills and viewpoints of others, individuals are empowered and group energy is mobilized to pursue collective goals. Decisions are made and actions are taken.

The development of leadership begins with personal initiative and an understanding one's passions, motivations, strengths, limitations, and personal values. This also includes an understanding of the ethical nature of leadership as it relates to one's character and a commitment to act with trustworthiness, respect, responsibility, fairness, caring and citizenship.

This process of self-discovery is ongoing and requires a commitment to lifelong learning through getting involved, reflecting on the experience, and stretching oneself to meet new challenges. The purpose of leadership development is not only for the benefit of oneself, but also to enable one to be a more effective leader in addressing important issues that affect oneself and others.

Leadership Competencies

The Leadership Development Certificate Program includes four general areas of leadership development and 13 specific skill areas. The faculty expects you to develop at least one skill in each of the four areas during this program.

- Personal leadership development
  - Understands leadership
  - Increase self-awareness
  - Practices ethical behavior
  - Sustains leadership over time
- Interpersonal leadership development
  - Values diversity
  - Enhances communication skills
  - Manages conflict
- Group and organizational leadership development
  - Develops teams
  - Leads change
  - Manages projects
- Community leadership development
  - Practices citizenship
  - Understands community
  - Serves others

Coaches

After you submit a Statement of Intent and a resume, you will be matched with a faculty or administrative professional staff member to guide and support you on your leadership journey. S/he will help you identify your leadership goals, connect you with campus resources, and encourage you to stretch yourself beyond your comfort zone by seeking out new leadership opportunities. The program, however, is yours, and the quality of your learning experiences is up to you.

Program Requirements

1. Submit a Statement of Intent with a resume to AGAD 121.
2. Contact the coach who has been assigned to you.
3. Complete the Leadership Skills and Attributes Self-Assessment.
4. Complete a Personal Development Plan.
5. Earn five points to receive a badge in personal leadership development.
6. Earn five points to receive a badge in interpersonal leadership development.
7. Earn five points to receive a badge in group/organizational leadership development.
8. Earn five points to receive a badge in community leadership development.
9. Write reflection papers on each leadership activity.
10. Write a reflection paper on each badge earned.
11. Develop a portfolio that documents your progress on your goals and how you reached them in each of the four major areas.

Everyone has leadership potential. Let LDCP help you tap yours!

LDCP focuses on four areas of leadership development:

- Personal

- Group/Organizational
- Interpersonal
- Community

In LDCP you will gain leadership experience tailored to you and your situation, enjoy one-on-one coaching, and develop the "soft skills" employers today are looking for. And when you complete LDCP and earn your certificate, it will appear on your transcript.

You are eligible for LDCP if you:

- Are enrolled as an undergraduate in the Purdue College of Agriculture
- Have at least three semesters remaining on campus before graduation
- Remain in good academic standing

https://ag.purdue.edu/oap/ldcp/Pages/Home.aspx

International Studies in Agriculture Minor

15-31 credits

The basic requirements for completing the minor are:

- Credit in a foreign lanugage through the fourth course (and one conversation course, if offered).
- In most cases, the language studied must be one spoken in the country or region in which the overseas experience is completed.
- Students whose overseas experience is an English-speaking country may meet the language requirement by studying any foreign language.
- Students whose overseas experience is in a country whose language is not taught at Purdue may substitute any other lanugage spoken in that region of the world.
- Fifteen credits of coursework with an international focus (See Below).
- At least six credits of this coursework should focus on the country/region of the student's overseas experience.
- Additional language courses can be used only if they are nonlinguistic in nature (i.e., literature, culture, etc).
- A minimum of six credits should be completed outside of the College of Agriculture.
- At least eight weeks abroad participating in an approved study abroad, cooperative work experience, internship, or cultural exchange.
- Complation and presentation of a summary paper in a seminar format which assimilates all components of the International Studies Minor.

Required Courses

(15 credits)

All/any credits earned via a Purdue approved Study Abroad Program

AGEC 25000 - Economic Geography Of World Food And Resources

Credit Hours: 3.00. A study of the important issues and economic decisions about worldwide resource use for food and fiber production as influenced by geography, climate, history, social institutions, national self-interest, and the environment. Typically offered Fall Spring.

AGEC 34000 - International Economic Development

Credit Hours: 3.00. This course is designed to introduce students to issues and problems related to international economic development. Topics covered include a description of the current situation in developing countries and the history of growth and development. The course is grounded in the body of theory associated with economic development, but concentrates on the many practical problems such as poverty, population growth, urbanization, education and the environment. The three areas with the greatest attention are agricultural development, international trade, and policy analysis for developing countries. Typically offered Spring.

AGEC 45000 - International Agricultural Trade

Credit Hours: 3.00. Study of U.S. agricultural trade with emphasis on international trade theory, exchange rates and their determination, relationships between domestic agricultural policies and trade policies, and analysis of institutional arrangements for world trade in agricultural products. Typically offered Fall.

AGEC 49800 - Special Problems

Credit Hours: 1.00 to 3.00. Open primarily to qualified seniors who want to study special problems in agricultural economics not covered in regular work. Permission of instructor required. Typically offered Fall Spring Summer.

ANTH 10000 - Introduction To Anthropology

Credit Hours: 3.00. A general introduction to anthropology's holistic approach to human nature and behavior. A basic survey of biocultural developmental and evolutionary processes, and human uniformity and diversity through time and across space. Typically offered Summer.

ANTH 20500 - Human Cultural Diversity

Credit Hours: 3.00. Using concepts and models of cultural anthropology, this course will survey the principal cultural types of the world and their distribution, and will undertake a detailed analysis of societies representative of each type. Typically offered Fall Spring.

ANTH 39200 - Selected Topics In Anthropology

Credit Hours: 1.00 to 3.00. Various topics in anthropology that may change from semester to semester are presented by anthropology faculty members. Typically offered Fall Spring Summer.

CLCS 23010 - Survey Of Greek Literature In Translation

Credit Hours: 3.00. Introduction to Ancient Greek literature from homer to Plato. All readings in English. Typically offered Fall Spring Summer.

CLCS 23100 - Survey Of Latin Literature

Credit Hours: 3.00. Highlights of literature written in Ancient Rome at times of political, social, and intellectual turbulence. Reading (all in English) includes Vergil's Aeneid, as well as selections from other influential Latin texts. Typically offered Fall Spring Summer.

CLCS 23200 - Classical Roots Of English Words

Credit Hours: 3.00. This is an introduction to English etymology with emphasis on building vocabulary. Students will learn English derivatives from both classical Greek and Latin. All texts to be read in English. Typically offered Fall Spring Summer.

CLCS 23300 - Comparative Mythology

Credit Hours: 3.00. Comparative study of the myths of major ancient cultures, with emphasis on shared typological features. Typically offered Summer Fall Spring.

CLCS 23500 - Introduction To Classical Mythology

Credit Hours: 3.00. Study of the myths of western antiquity, as represented in ancient Greek and Latin texts and images. Typically offered Fall Spring Summer.

CLCS 23700 - Gender And Sexuality In Greek And Roman Antiquity

Credit Hours: 3.00. How identities based on gender, sexual behavior and sexual desire, and socio-economic status are established in ancient Greece and Rome. Exploration of why these ancient views of gender and sexuality remain of continuing importance in the 21st century. All readings in English. Typically offered Fall Spring Summer.

CLCS 23800 - The Tragic Vision

Credit Hours: 3.00. Greek and Roman tragedy from their beginnings until today. Readings in English from representative authors such as Aeschylus, Sophocles, Euripides, and Seneca; later receptions of ancient tragedy in drama and other media. Course may include performance, theories of comedy and tragedy, or recent and current expressions of the tragic in film and other media. Typically offered Fall Spring.

CLCS 23900 - The Comic Vision

Credit Hours: 3.00. This course investigates Greek and Roman comedy from their beginnings until today. The course will feature readings in English from representative authors such as Aristophanes, Menander, Plautus, and Terence, as well as later receptions of ancient comedy in drama and other media. This course may include performance, theories of comedy and tragedy, theories of humor, or recent and current expressions of the comic in film and other media. Typically offered Fall Spring Summer.

CLCS 33900 - Literature And The Law

Credit Hours: 3.00. Study of literary texts that shed light on the varied practices and ideals that different ancient and modern societies have regarded as "lawful", "just", and "good". Exploration of questions and conflicts arising from disagreement about these ideals and from the difficulties enacting them through legal systems, political structures, and individual choices. Typically offered Fall Spring Summer.

ECON 37000 - International Trade

Credit Hours: 3.00. Develops an understanding of the economics of globalization, including the movement of goods, people, capital, and ideas across countries. Using the tools of intermediate economic theory, we discuss the benefits and costs of globalization, the implications of globalization for wages, earnings, and national welfare, and their intersection with government policies. Typically offered Fall Spring.

ECON 46600 - International Economics

Credit Hours: 3.00. Analyzes topics in international economics, using more advantage techniques and more detailed treatment than in ECON 37000 or ECON 37100. While coverage varies somewhat with instructor, some topics could include: economic growth, innovation and technology transfer, and the role of multinational corporations. Typically offered Fall Spring.

ENGL 26600 - World Literature: From The Beginnings To 1700 A.D.

Credit Hours: 3.00. (CMPL 26600) World literature in translation. A comparative and chronological survey of the masterpieces of Eastern and Western literature. Typically offered Summer Fall Spring. CCN: IEL 1250 World Literature 1

ENGL 26700 - World Literature: From 1700 A.D. To The Present

Credit Hours: 3.00. (CMPL 26700) World literature in translation. A comparative and chronological survey of the masterpieces of Eastern and Western literature. Typically offered Summer Fall Spring. CCN: IEL 1251 World Literature 2

- FLL 10000 - 5999 any course - Credit Hours: 3.00

HIST 24000 - East Asia And Its Historic Tradition

Credit Hours: 3.00. Survey of the great historic traditions of China, Japan, and Korea from earliest times to approximately 1600, with special attention to state formation, society, intellectual, philosophical, and religious developments, and the visual, musical, and literary arts. Typically offered Fall.

HIST 24100 - East Asia In The Modern World

Credit Hours: 3.00. The response of China, Japan, and Korea to the coming of the West in modern times, with special stress on the effect of Western ideas and machines. Approximately 1600 to the present. Typically offered Spring.

HIST 24300 - South Asian History And Civilizations

Credit Hours: 3.00. Survey history of India, Pakistan, and Bangladesh, from the origins of South Asian civilization to the present. Topics include ancient India, the Mughal Empire, the colonial experience, the independence movement, and conflict and popular culture. Typically offered Fall Spring.

HIST 24500 - Introduction To The Middle East History And Culture

Credit Hours: 3.00. A survey of the civilization of the Middle East from the rise of Islam to the present. The political, social, and cultural institutions are examined along with the problem of adjusting these to the pressure of Western civilization in the last two centuries. Typically offered Fall Spring.

HIST 24600 - Modern Middle East And North Africa

Credit Hours: 3.00. This course explores the political, social, and cultural factors that have contributed to the formation of the modern Middle East. Course includes short stories and a selection of documentary films from the region. Typically offered Summer Fall Spring.

HIST 27100 - Introduction To Colonial Latin American History (1492-1810)

Credit Hours: 3.00. The purpose of this general survey course is to introduce students to the principle historical themes of Latin America during the colonial period (roughly, from 1492 to 1810). No prior knowledge of Latin American history is required. Typically offered Fall Spring Summer.

HIST 27200 - Introduction To Modern Latin American History (1810 To The Present)

Credit Hours: 3.00. The purpose of this general survey course is to introduce students to the study of the major economic, political, social, and cultural processes that shaped modern Latin American nations since independence. No prior knowledge of Latin American history is required. Typically offered Fall Spring Summer.

HIST 30000 - Eve Of Destruction: Global Crises And World Organization In The 20th Century

Credit Hours: 3.00. Using a variety of case studies, this course considers 20th-century turning points -- often violent and disastrous ones -- in an emerging global conversation about urgent world problems and their possible solutions. Typically offered Summer Fall Spring.

HIST 30200 - Historical Topics

Credit Hours: 3.00. This variable-title course deals with broad historical topics that transcend and collapse traditional analytical, chronological, and geographic boundaries. Content will vary with faculty member teaching the class. Typically offered Fall Spring.

HIST 32300 - German History

Credit Hours: 3.00. A survey of German history from the earliest times until the present. After a brief description of the medieval empire, we will turn to the Germany of Bismarck and Hitler and its successor states. A recurring theme will be the struggle between forces of liberalism and democracy and those of authoritarianism and militarism. Typically offered Fall Spring.

HIST 32400 - Modern France

Credit Hours: 3.00. A survey of modern France since 1789, including political, social, industrial, and institutional development. Emphasis is also placed upon the colonial and international aspects of French history. Typically offered Fall Spring.

HIST 34000 - Modern China

Credit Hours: 3.00. Chinese history from the Qing Dynasty (1644) to the present, with emphasis on the period since 1800. Attention given to internal developments and China's response to Western thought and material accomplishments. Nationalism and communism in the twentieth century are examined. Typically offered Spring.

HIST 34100 - History Of Africa South Of The Sahara

Credit Hours: 3.00. An introductory survey of major movements and problems in the development of the people of sub-Saharan Africa from the dawn of history to the mid-twentieth century. Attention is directed to the response of Africans to their

environment and to various external challenges - Islam, European colonization, and the industrial revolution. Typically offered Fall Spring.

HIST 34200 - Africa And The West

Credit Hours: 3.00. The study of Africa's relations with Europe and the Americas, emphasizing economic and cultural crosscurrents from the period of the Atlantic slave trade to the rise of modern nationalism. Typically offered Fall Spring.

HIST 34300 - Traditional Japan

Credit Hours: 3.00. The course considers Japanese civilization from its origins to the establishment of the Tokugawa Shogun (1603). Divided between political and cultural history, it will emphasize the development of traditional institutions in Japanese society, religion, philosophy, art, and literature. Typically offered Fall.

HIST 34400 - History Of Modern Japan

Credit Hours: 3.00. A survey of Japanese history from the nineteenth century to the present, including Japan's response to Western expansionism, the formation of the modern state, political parties, industrialization, the Pacific War, the American Occupation, the postwar "economic miracle," and Japan today. Typically offered Spring.

HIST 40800 - Dictatorship And Democracy: Europe 1919-1945

Credit Hours: 3.00. This course examines the fleeting triumph of democracy across Europe. Followed by the rise of fascism, communism, and Nazism. Emphasis will be placed on broad economic, social, and cultural transformations as well as individual choices to resist or conform. Typically offered Fall Spring.

HIST 43900 - Communist China

Credit Hours: 3.00. The evolution of the Communist movement (1921-1949) and the development of the Communist government (since 1949) in China. Attention is given to political, economic, social, and cultural changes. Typically offered Spring.

HIST 47200 - History Of Mexico

Credit Hours: 3.00. A history of the Mexican people from the pre-Columbian period to present. Special emphasis is placed on the successful social revolutions that led to the development of today's dynamic nation. Typically offered Fall Spring.

HIST 59500 - The Holocaust And Genocide

Credit Hours: 3.00. (POL 59500) History and analysis of the Nazi attempt to destroy the European Jews, with comparisons to other instances of genocide. Typically offered Spring Fall.

PHIL 11000 - Introduction To Philosophy

Credit Hours: 3.00. The basic problems and types of philosophy, with special emphasis on the problems of knowledge and the nature of reality. Typically offered Summer Fall Spring. CTL:ISH 1050 Introduction To Philosophy

PHIL 23000 - Religions Of The East

Credit Hours: 3.00. (REL 23000) A study of the history, teachings, and present institutions of the religions of India, Southeast Asia, China, and Japan. This will include Hinduism, Jainism, Sikhism, Buddhism, Confucianism, Taoism, Shintoism, and Zoroastrianism. Typically offered Fall Spring Summer.

PHIL 23100 - Religions Of The West

Credit Hours: 3.00. (REL 23100) A comparative study of the origins, institutions, and theologies of the three major Western religions, Judaism, Christianity, and Islam. Typically offered Fall Spring Summer.

POL 13000 - Introduction To International Relations

Credit Hours: 3.00. An analysis of the fundamentals of international law, organization, and politics, particularly as relevant to contemporary international relations. Typically offered Summer Fall Spring. CTL:ISH 1003 Introduction To World Politics

POL 14100 - Governments Of The World

Credit Hours: 3.00. An introduction to the politics and government in selected foreign countries. The course presents the tools and background needed to understand contemporary events in the world beyond the United States. Readings and discussions pay special attention to democratization and development. Typically offered Summer Fall Spring.

POL 23100 - Introduction To United States Foreign Policy

Credit Hours: 3.00. Designed to introduce students to the major themes and issues in contemporary U.S. foreign policy. Lectures, discussion, and readings will examine such areas as U.S. relationships with the major powers, the Third World, and international organizations. Typically offered Fall Spring.

POL 23200 - Contemporary Crises In International Relations

Credit Hours: 3.00. The focus of this course will be on major world crises, such as in the Middle East and Southern Africa, and ways in which these crises may be analyzed. Typically offered Fall Spring.

POL 23500 - International Relations Among Rich And Poor Nations

Credit Hours: 3.00. Introduction to the major themes in the contemporary international relations among rich and poor nations. Examines such areas as North-South relations, interdependence, international organizations, and global development. Typically offered Fall Spring.

POL 23700 - Modern Weapons And International Relations

Credit Hours: 3.00. This course introduces the student to the roles that modern weapons systems play in contemporary international relations. Typically offered Fall Spring.

POL 32700 - Global Green Politics

Credit Hours: 3.00. Analysis and assessment of the nature of global environmentalism, its connections with other new social movements, and its impact on domestic and international politics worldwide, with particular attention to green political parties and nongovernmental organizations. Typically offered Fall Spring Summer.

POL 34500 - West European Democracies In The Post-Industrial Era

Credit Hours: 3.00. An introduction to the political institutions and processes in West European democracies. The course focuses on the ability of Western democracy to survive the transition to the post-industrial era. Typically offered Fall Spring.

POL 34800 - East Asian Politics

Credit Hours: 3.00. The course will examine East Asian politics and society, with special emphasis on Japan. Typically offered Fall Spring.

POL 43300 - International Organization

Credit Hours: 3.00. A study of the structure and functions of the United Nations and associated agencies, with an emphasis on the role of this system in contemporary international relations. Typically offered Fall Spring.

POL 43400 - United States Foreign Policy, Central America And The Caribbean

Credit Hours: 3.00. This course examines United States foreign policy toward Central America and the Caribbean and the impacts of the policy on the region. Typically offered Fall Spring Summer.

POL 43500 - International Law

Credit Hours: 3.00. A study of international legal theories, principles, and practices, with an emphasis on the role and utility of law in contemporary international relations. Typically offered Fall Spring.

Notes

Departmental permission is required to enroll in this minor. Please contact Tim Kerr in Room 121 of the Agricultural Administration Building.

In order to earn the International Studies Minor, students should have their Plan of Study approved a minimum of six months prior to graduation.

Landscape and Turf Minor

13-14 credits

Required Courses

(10 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21100 - Fundamentals of Turfgrass Culture Laboratory

Credit Hours: 1.00. (AGRY 21100) Companion lab to AGRY 21000. Laboratory exercises will focus on turfgrass and seed

anatomy, morphology, identification as well as the hands-on basic principles of turfgrass culture. Designed for the student who intends to pursue a career in turfgrass management and plans to enroll in AGRY 51000. Enrollment preference will be given to Turfgrass Science Majors. Typically offered Spring.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

Selectives

(3-4 credits from the following)

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

Students in the follwoing major/concentrations cannot obtain a Landscape and Turf Minor:

- Horticulture Landscape Enterprise Management
- Horticulture Landscape Contracting Management
- Horticulture Landsape Design
- Turf Science and Management

Landscape Management Minor

12-13 credits

Required Courses

(9-10 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

One course from the following Plant Materials Must be completed

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

Selectives

(3 credits from the following)

BTNY 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (ENTM 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

Students in the following majors/concentrations cannot obtain a Landscape Management Minor:

- Horticulture/Landscape Enterprise Management
- Horticulture/Landscape Contracting Management
- Horticulture/Landscape Design
- Horticulture/Landscape Horticulture and Design

Natural Resources and Environmental Science Minor

15 credits

Required Courses

(3 credits)

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Selectives

(12 credits from the following)

General Environmental Science Emphasis

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

NRES 23000 - Survey Of Meteorology

Credit Hours: 3.00. (EAPS 22100) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate, ozone depletion, and other contemporary issues. Typically offered Fall Spring.

NRES 25500 - Soil Science

Credit Hours: 3.00. (AGRY 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

Ecology Emphasis

AGRY 34900 - Soil Ecology

Credit Hours: 3.00. An introductory course that will cover the basic concepts of soil ecology. Biological diversity and the interactions between and within biotic and abiotic components of the soil ecosystem, nutrient cycling, and genetic engineering are introduced. Typically offered Fall.

BIOL 48300 - Great Issues: Environmental And Conservation Biology

Credit Hours: 3.00. Concerned with the application of ecological principles to environmental issues, the course introduces fundamental ecology, emphasizing the interplay of theoretical models, natural history, and experimentation. New research developments are stressed, with the outlook for application to environmental management and restoration. Whole-biosphere issues, such as the loss of biological diversity, frame a focus at the population level to understand local and global extinction and community stability. In-depth case studies of endangered ecosystems (both temperate and tropical), with computer modeling, field trips, and discussions of policy formulation, demonstrate the range of tools and information necessary to accomplish coexistence of humans with the rest of nature. Typically offered Fall.

ENTM 31100 - Insect Ecology

Credit Hours: 3.00. Insect ecology investigates the fundamental concepts of ecology as they relate to insects, including insect interactions, other insects and their environment. Topics include population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and theoretical and applied ecology. Examples from current entomological and ecological studies are used. Completion of college biology or an introductory course in entomology is recommended. Typically offered Spring.

Policy and Economic Emphasis

AGEC 40600 - Natural Resource And Environmental Economics

Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues. Typically offered Fall Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

POL 32700 - Global Green Politics

Credit Hours: 3.00. Analysis and assessment of the nature of global environmentalism, its connections with other new social movements, and its impact on domestic and international politics worldwide, with particular attention to green political parties and nongovernmental organizations. Typically offered Fall Spring Summer.

Land Resources Emphasis

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

ASM 33600 - Environmental Systems Management

Credit Hours: 3.00. Analysis of environmental systems with special emphasis on non-urban and agribusiness needs. Technological and sociological solutions to environmental problems. Computer-based tools are used to analyze global environmental issues, chemical use and management, waste disposal and management, water and air quality, soil and water conservation, sustainable agriculture, regulatory and policy issues. Typically offered Fall.

NRES 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (AGRY 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in the framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or mathematics background. Typically offered Fall.

Sustainability Emphasis

AD 39700 - Sustainability In The Built Environment

Credit Hours: 3.00. The study of philosophical concepts, principles, and theories of sustainability as they pertain to building methods, materials, systems, and occupants. To provide a foundation for evaluation of materials, processes, and applications of design components for environmentally responsible. Field trips will be required. Typically offered Fall Spring.

BCM 51000 - Topics In Environmentally Sustainable Construction, Design And Development

Credit Hours: 3.00. This course explores environmental sustainability in all its forms, starting with the historical and theoretical basis and continuing through an understanding of sustainable building construction, design, development, and renewable energy strategies/management tools and how these can be applied in practice. Typically offered Fall Spring Summer.

CE 35500 - Engineering Environmental Sustainability

Credit Hours: 3.00. (EEE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. Typically offered Spring.

Water Quality Emphasis

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

AGRY 12000 - Water And Food Security

Credit Hours: 3.00. General science introduction to global and regional water resources issues, especially with respect to food security. It will address the role of water in agriculture throughout the world and agriculture's impact on water resources. Students will focus first on developing the scientific underpinnings of water supply and crop water use. With this background, they will explore key issues relating to water scarcity and balancing agricultural and urban demands for water, water quality and soil salinization, water footprints of food and the use of virtual water embedded in food to offset national waer deficits, regulation and roles science and policy in solving water problems. Typically offered Fall Spring.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

Notes

Department permission is not required to enroll in this minor.

Sustainable Environments Minor

15 credits

Required Courses

(3 credits)

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

Selectives

(12 credits from the following)

AD 39700 - Sustainability In The Built Environment

Credit Hours: 3.00. The study of philosophical concepts, principles, and theories of sustainability as they pertain to building methods, materials, systems, and occupants. To provide a foundation for evaluation of materials, processes, and applications of design components for environmentally responsible. Field trips will be required. Typically offered Fall Spring.

ASM 33600 - Environmental Systems Management

Credit Hours: 3.00. Analysis of environmental systems with special emphasis on non-urban and agribusiness needs. Technological and sociological solutions to environmental problems. Computer-based tools are used to analyze global environmental issues, chemical use and management, waste disposal and management, water and air quality, soil and water conservation, sustainable agriculture, regulatory and policy issues. Typically offered Fall.

BCM 51000 - Topics In Environmentally Sustainable Construction, Design And Development

Credit Hours: 3.00. This course explores environmental sustainability in all its forms, starting with the historical and theoretical

basis and continuing through an understanding of sustainable building construction, design, development, and renewable energy strategies/management tools and how these can be applied in practice. Typically offered Fall Spring Summer.

BIOL 48300 - Great Issues: Environmental And Conservation Biology

Credit Hours: 3.00. Concerned with the application of ecological principles to environmental issues, the course introduces fundamental ecology, emphasizing the interplay of theoretical models, natural history, and experimentation. New research developments are stressed, with the outlook for application to environmental management and restoration. Whole-biosphere issues, such as the loss of biological diversity, frame a focus at the population level to understand local and global extinction and community stability. In-depth case studies of endangered ecosystems (both temperate and tropical), with computer modeling, field trips, and discussions of policy formulation, demonstrate the range of tools and information necessary to accomplish coexistence of humans with the rest of nature. Typically offered Fall.

CE 35500 - Engineering Environmental Sustainability

Credit Hours: 3.00. (EEE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. Typically offered Spring.

EAPS 30100 - Oil !

Credit Hours: 3.00. Petroleum is a common thread that interweaves Geoscience with the Political-Economic history of the 20th century. Its dominance in current society has major repercussions on our current and future society and environment. The unequal distribution of petroleum and natural gas, coupled with innovative geologists and engineers, has set the stage for the modern geo-political world. This course is a unique survey into the multitude of aspects of petroleum -- from its formation to "resource wars". Typically offered Fall.

EAPS 32700 - Climate, Science And Society

Credit Hours: 3.00. This course will examine the broad problems of climate change by examining the relationship between science, politics, and society by using climate change as a lens through which to examine larger issues. Students will be encouraged to identify similar themes in their own experiences as emerging scientists, engineers and global leaders. Adequate preparation to write essays and perform basic arithmetic calculations needed. Prior knowledge of climate change science is not necessary. Typically offered Fall Spring.

EAPS 37500 - Great Issues - Fossil Fuels, Energy And Society

Credit Hours: 3.00. Prosperity of the 20th century was based on abundant and cheap energy; during the 21st century we will be faced with difficult challenges. Our society will face higher energy prices, decline of petroleum based fuels supplies, increased environmental effects of fossil fuels usage, and the challenge of solving the technological problems of developing alternative fuels. This course will review the structure, economics, and geopolitical issues faced by fossil fuel industries and the mitigation strategies that will be needed to change to low fossil fuel use society based on low polluting renewable energy sources. Counts for Great Issues course in College of Science for Juniors and Seniors. Typically offered Fall Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

FNR 48800 - Global Environmental Issues

Credit Hours: 3.00. Examination of the state of the world in terms of natural resource consumption, environmental quality, and global change. Techniques to analyze and evaluate information. Survey threats to soil productivity, the changing atmosphere, water quality and quantity, energy impacts, and biodiversity from an ecosystem perspective. Typically offered Fall.

HORT 44200 - Sustainability In The Managed Landscape

Credit Hours: 1.00. Presents recent advances in the science and technology of sustainable practices for managed landscapes. This course will utilize a lecture format with the combination of presentations by the instructor, expert guest speakers, and students. Offered in even-numbered years. Course enrollment is capped at 14. Typically offered Spring.

POL 32700 - Global Green Politics

Credit Hours: 3.00. Analysis and assessment of the nature of global environmentalism, its connections with other new social movements, and its impact on domestic and international politics worldwide, with particular attention to green political parties and nongovernmental organizations. Typically offered Fall Spring Summer.

Notes

Departmental permission is not required to enroll in this minor.

Pre-Environmental Studies

The Pre-Environmental Studies program of study is intended to serve as a portal for students entering Purdue with an interest in environmental studies who are undecided as to the specific program of study in which they want to enroll.

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12200 - Introduction To Natural Resources And Environmental Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of

definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

14 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00
- Elective - Credit Hours: 3.00

16 Credits

Pre-Veterinary Medicine

About the Program

Preveterinary medicine is not really a major, but rather is a collection of prerequisites for admission to Purdue's College of Veterinary Medicine. Students may enter the College of Agriculture in this category, but later must pick a major to pursue. Students pursuing a wide variety of curricula may apply and be admitted to a veterinary college.

The preveterinary medicine curriculum includes courses that are required for admission to the Doctor of Veterinary Medicine degree program offered by the Purdue College of Veterinary Medicine. This program of study, coordinated by the College of Agriculture Office of Academic Programs, emphasizes the biological and physical sciences that are foundations for successful study of veterinary medicine. Also, the curriculum includes courses in communication and the social sciences.

Preveterinary Medicine
OAP • Pre-Professional • Credits: 93

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

Program Requirements

Fall 1st Year

- AGR 10100 - Introduction To The College Of Agriculture And Purdue University
- AGR 12400 - Introduction To College Of Agriculture Pre Veterinary Medicine Academic Programs
- BIOL 11000 - Fundamentals Of Biology I

- CHM 11500 - General Chemistry
- ENGL 10600 - First-Year Composition
- MA 16010 - Applied Calculus I ♦

16 Credits

Spring 1st Year

- BIOL 11100 - Fundamentals Of Biology II
- CHM 11600 - General Chemistry
- COM 11400 - Fundamentals Of Speech Communication or
- COM 21700 - Science Writing And Presentation
- MA 16020 - Applied Calculus II
- VM 10200 - Careers In Veterinary Medicine

15 Credits

Fall 2nd Year

- ANSC 22100 - Principles Of Animal Nutrition
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- CHM 25500 - Organic Chemistry
- CHM 25501 - Organic Chemistry Laboratory
- UCC Science, Technology, and Society Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

- AGRY 32000 - Genetics
- AGRY 32100 - Genetics Laboratory
- CHM 25600 - Organic Chemistry
- CHM 25601 - Organic Chemistry Laboratory
- Agricultural Selective - Credit Hours: 3.00

- Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

17 Credits

Fall 3rd Year

- BCHM 30700 - Biochemistry
- PHYS 22000 - General Physics
- STAT 30100 - Elementary Statistical Methods
- Agricultural Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- BIOL 22100 - Introduction To Microbiology
- PHYS 22100 - General Physics
- Humanities or Social Science Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00

14 Credits

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Department of Agricultural and Biological Engineering

Overview

Welcome to the Department of Agricultural & Biological Engineering at Purdue University. Our mission is to prepare students, citizens, and industry for the future through innovative education and extension/outreach programs and the discovery of knowledge.

Our cross-disciplinary strengths include academic and research programs in agriculture, biology, and engineering, as well as dual degree programs. Our engineering degrees are granted by the College of Engineering and our agricultural systems management degree is granted by the College of Agriculture. The job market remains strong for our graduates who have excellent career opportunities, and demand for our graduates is very high.

Our faculty, students and staff are pursuing cutting-edge research that improves quality of life as well as advances scientific and engineering frontiers. Our extension programs are helping citizens of Indiana and beyond improve their lives.

Faculty

https://engineering.purdue.edu/ABE/People/ptFaculty

Contact Information

Department of Agricultural & Biological Engineering

Purdue University

Agricultural and Biological Engineering Building

225 South University Street
West Lafayette, IN 47907-2093
Phone: (765) 494-1162
Fax: (765) 496-1115
engineering.purdue.edu/ABE

joinabe@ecn.purdue.edu

The Main office for the department is located in Room 201 of the ABE Building.

Graduate Information

For Graduate Information please see Agricultural and Biological Engineering Graduate Program Information.

Agricultural Engineering, BSAGE

About the Program

Agricultural engineers apply their knowledge of agricultural systems, natural resources, and engineering to equipment design and assure environmental compatibility of practices used by production agriculture. The Agricultural Engineering curriculum offers great breadth, with specialization choices in machine systems engineering and environmental and natural resources engineering. Subject areas include computer-aided engineering, fluid power, finite element analysis, natural resource conservation, and engineering properties of biological materials. Excellent career opportunities exist in product engineering, equipment research and design, facilities design, environmental consulting, and engineering management.

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Engineering include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

128 credits required for graduation

Departmental/Program Major Courses (126 or 125 credits)

Required Major Courses (34 credits)

ABE 20500 - Computations For Engineering Systems

Credit Hours: 3.00. Development of engineering problem solving and design skills. Use of Excel, Matlab, and MathCad for problem solving, data analysis, numerical modeling, and statistics. Introduction to elementary statics, dynamics, materials, thermodynamics, fluid mechanics, and energy topics. Typically offered Fall.

ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems

Credit Hours: 3.00. Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production. Typically offered Spring.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

ABE 30500 - Physical Properties Of Biological Materials

Credit Hours: 3.00. Physical properties of agricultural crops and food products and their relationship to harvesting, storage, and processing. Physical properties covered include: density, shape, moisture content, water potential, water activity, friction and flow or particulate solids, terminal velocity, thermal properties, interaction with electromagnetic radiation, and viscoelastic behavior of solids. Typically offered Fall.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

ABE 32000 - Solid Modeling, Simulation, And Analysis

Credit Hours: 3.00. Introduction to parametric, feature-based solid modeling; dimensioned 2D and 3D engineering drawings; tolerancing; mechanical dynamic simulation; kinematic models, analysis and simulation of simple linkages and complex systems; mechanism design and evaluation; visualization and animation of results; interfacing of computer aided engineering software. Projects involving industrial parts and assemblies will be discussed and assigned. Typically offered Spring.

ABE 33000 - Design Of Machine Components

Credit Hours: 3.00. Introduction to design; stress analysis; deformation and stiffness considerations; static and fatigue strength design; design of components of the food processing, farm and off-highway machines, and mechanical systems. Typically offered Spring.

ABE 43500 - Hydraulic Control Systems For Mobile Equipment

Credit Hours: 3.00. Design of basic fluid power components and systems. Includes power steering, hydrostatic and hydromechanical transmission, electrohydraulic servovalves, servomechanism, and manually controlled systems. Typically offered Fall.

ABE 45000 - Finite Element Method In Design And Optimization

Credit Hours: 3.00. Fundamentals of the finite element method as it is used in modeling, analysis, and design of thermal/fluid and mechanical systems; one- and two-dimensional elements; boundary value problems, heat transfer and fluid flow problems; structural and solid mechanics problems involving beam, truss, plate and shell elements; computer-aided design and optimization of machine components, structural elements and thermal/fluid system. Typically offered Fall.

ABE 48400 - Project Planning And Management

Credit Hours: 1.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Fall.

ABE 48600 - Agricultural Engineering Design

Credit Hours: 3.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Spring.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

Other Departmental /Program Course Requirements (92 or 91 credits)

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students

majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

ME 27000 - Basic Mechanics I

Credit Hours: 3.00. Vector operations, forces and couples, free body diagrams, equilibrium of a particle and of rigid bodies. Friction. Distributed forces. Centers of gravity and centroids. Applications from structural and machine elements, such as bars, trusses, and friction devices. Kinematics and equations of motion of a particle for rectilinear and curvilinear motion. Typically offered Fall Spring Summer.

ME 27400 - Basic Mechanics II

Credit Hours: 3.00. Review and extension of particle motion to include energy and momentum principles. Planar kinematics of rigid bodies. Kinetics for planar motion of rigid bodies, including equations of motion and principles of energy and momentum. Three-dimensional kinematics and kinetics of rigid bodies. Linear vibrations, with emphasis on single-degree-of-freedom systems. Typically offered Fall Spring Summer.

NUCL 27300 - Mechanics Of Materials

Credit Hours: 3.00. Analysis of stress and strain; equations of equilibrium and compatibility; stress-strain laws; extension, torsion, and bending of bars; membrane theory of pressure vessels; combined loading conditions; transformation of stresses and principal stresses; elastic stability, elected topics. Typically offered Fall Spring Summer.

CE 34000 - Hydraulics

Credit Hours: 3.00. Fluid properties; hydrostatics; kinematics and dynamics of fluid flows; conservation of mass, energy, and momentum; flows in pipes and open channels. Formal laboratory experiments. Typically offered Summer Fall Spring.

CE 34300 - Elementary Hydraulics Laboratory

Credit Hours: 1.00. The laboratory covers basic concepts in analysis of experimental data and methods in hydraulic measurements. A variety of simple laboratory experiments illustrating the principles of hydraulics are performed. Typically offered Summer Fall Spring.

ME 30900 - Fluid Mechanics

Credit Hours: 4.00. Continuum, velocity field, fluid statics, manometers, basic conservation laws for systems and control volumes, dimensional analysis. Euler and Bernoulli equations, viscous flows, boundary layers, flow in channels and around submerged bodies, one-dimensional gas dynamics, turbomachinery. Typically offered Fall Spring.

- Engineering Technical Selective - Credits: 3.00
- Engineering Technical Selective - Credits: 3.00

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

- Agricultural Selective - Credit Hours: 3.00
- Biological Science Selective (satisfies Science #1 for core) - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

- Written and Oral Communication Selective - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 2.00

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

Electives (2 or 3 credits)

- Elective - Credit Hours: 2.00 or 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree.
- 32 Upper division credits taken from Purdue
- 6 credits International Understanding
- 3 credits Multicultural Awareness
- 3 credits of Humanities or Social Science Selective (30000+ level)
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

128 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

Program Requirements

Fall 1st Year

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

- UCC Humanities Selective - Credit Hours: 3.00

17 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

16/17 Credits

Fall 2nd Year

ABE 20500 - Computations For Engineering Systems

Credit Hours: 3.00. Development of engineering problem solving and design skills. Use of Excel, Matlab, and MathCad for problem solving, data analysis, numerical modeling, and statistics. Introduction to elementary statics, dynamics, materials, thermodynamics, fluid mechanics, and energy topics. Typically offered Fall.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

ME 27000 - Basic Mechanics I

Credit Hours: 3.00. Vector operations, forces and couples, free body diagrams, equilibrium of a particle and of rigid bodies. Friction. Distributed forces. Centers of gravity and centroids. Applications from structural and machine elements, such as bars, trusses, and friction devices. Kinematics and equations of motion of a particle for rectilinear and curvilinear motion. Typically offered Fall Spring Summer.

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

- Economics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems

Credit Hours: 3.00. Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production. Typically offered Spring.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

ME 27400 - Basic Mechanics II

Credit Hours: 3.00. Review and extension of particle motion to include energy and momentum principles. Planar kinematics of rigid bodies. Kinetics for planar motion of rigid bodies, including equations of motion and principles of energy and momentum. Three-dimensional kinematics and kinetics of rigid bodies. Linear vibrations, with emphasis on single-degree-of-freedom systems. Typically offered Fall Spring Summer.

NUCL 27300 - Mechanics Of Materials

Credit Hours: 3.00. Analysis of stress and strain; equations of equilibrium and compatibility; stress-strain laws; extension, torsion, and bending of bars; membrane theory of pressure vessels; combined loading conditions; transformation of stresses and principal stresses; elastic stability, elected topics. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00

17 Credits

Fall 3rd Year

ABE 30500 - Physical Properties Of Biological Materials

Credit Hours: 3.00. Physical properties of agricultural crops and food products and their relationship to harvesting, storage, and processing. Physical properties covered include: density, shape, moisture content, water potential, water activity, friction and flow or particulate solids, terminal velocity, thermal properties, interaction with electromagnetic radiation, and viscoelastic behavior of solids. Typically offered Fall.

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

CE 34000 - Hydraulics

Credit Hours: 3.00. Fluid properties; hydrostatics; kinematics and dynamics of fluid flows; conservation of mass, energy, and momentum; flows in pipes and open channels. Formal laboratory experiments. Typically offered Summer Fall Spring.

CE 34300 - Elementary Hydraulics Laboratory

Credit Hours: 1.00. The laboratory covers basic concepts in analysis of experimental data and methods in hydraulic measurements. A variety of simple laboratory experiments illustrating the principles of hydraulics are performed. Typically offered Summer Fall Spring.

or

ME 30900 - Fluid Mechanics

Credit Hours: 4.00. Continuum, velocity field, fluid statics, manometers, basic conservation laws for systems and control volumes, dimensional analysis. Euler and Bernoulli equations, viscous flows, boundary layers, flow in channels and around submerged bodies, one-dimensional gas dynamics, turbomachinery. Typically offered Fall Spring.

- Agricultural Selective - Credit Hours: 3.00

17 Credits

Spring 3rd Year

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition

are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 32000 - Solid Modeling, Simulation, And Analysis

Credit Hours: 3.00. Introduction to parametric, feature-based solid modeling; dimensioned 2D and 3D engineering drawings; tolerancing; mechanical dynamic simulation; kinematic models, analysis and simulation of simple linkages and complex systems; mechanism design and evaluation; visualization and animation of results; interfacing of computer aided engineering software. Projects involving industrial parts and assemblies will be discussed and assigned. Typically offered Spring.

ABE 33000 - Design Of Machine Components

Credit Hours: 3.00. Introduction to design; stress analysis; deformation and stiffness considerations; static and fatigue strength design; design of components of the food processing, farm and off-highway machines, and mechanical systems. Typically offered Spring.

- Biological Science Selective - Credit Hours: 4.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

ABE 43500 - Hydraulic Control Systems For Mobile Equipment

Credit Hours: 3.00. Design of basic fluid power components and systems. Includes power steering, hydrostatic and hydromechanical transmission, electrohydraulic servovalves, servomechanism, and manually controlled systems. Typically offered Fall.

ABE 45000 - Finite Element Method In Design And Optimization

Credit Hours: 3.00. Fundamentals of the finite element method as it is used in modeling, analysis, and design of thermal/fluid and mechanical systems; one- and two-dimensional elements; boundary value problems, heat transfer and fluid flow problems; structural and solid mechanics problems involving beam, truss, plate and shell elements; computer-aided design and optimization of machine components, structural elements and thermal/fluid system. Typically offered Fall.

ABE 48400 - Project Planning And Management

Credit Hours: 1.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

- Engineering Technical Selective - Credit Hours: 3.00
- Written and Oral Communication Selective - Credit Hours: 3.00

14 Credits

Spring 4th Year

ABE 48600 - Agricultural Engineering Design

Credit Hours: 3.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Spring.

- Engineering Technical Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 2.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 2.00 or 3.00 *

13/14 Credits

Requirements

128 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Systems Management, BS

About the Program

Agricultural Systems Management (ASM) prepares individuals to organize and manage environmentally sound, technology-based businesses. The program's emphasis is on planning and directing an industry or business project with responsibility for results. ASM is based on an understanding of how equipment and buildings are used with plants and animals and their products. These processes require an understanding of the biological sciences to produce and maintain top product quality.

Computer skills are taught and used throughout the curriculum. Computers are used to collect and analyze data, and then using that information, to control machines and processes. Other uses involve planning layouts of equipment and buildings, creating graphics for reports, etc. Agricultural Systems Management students also take several of courses in communications, business management and agricultural sciences, in addition to their specialty courses based in the Agricultural and Biological Engineering Department. The program provides an in-depth technical knowledge for selecting and applying advanced technologies in the food, feed, fiber, and fuel system. Graduates are prepared to solve a wide variety of business and technical problems in a job field that continues to grow.

Agricultural Systems Management students also take several of courses in communications, business management and agricultural sciences, in addition to their specialty courses based in the Agricultural and Biological Engineering Department. The program provides an in-depth technical knowledge for selecting and applying advanced technologies in the food, feed, fiber, and fuel system. Graduates are prepared to solve a wide variety of business and technical problems in a job field that continues to grow.

Some of the factors that contribute to Agricultural & Biological Engineering at Purdue University being a top ranked program:

- Multiple opportunitires for interaction with faculty in laboratories and in classes
- Student Competitions, Clubs, Global Experiences
- Personalized advising and attention from faculty
- Practical curriculum for indutrial careers
- Freat opportunities for scholarships and internships
- Excellent placement record and starting salaries

Watch a video and take a look at some senior projects. We hope to see you in ABE soon!

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Systems Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-

friendly, but include less descriptive course detail.
Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (119 credits)

Required Major Courses (22 credits)

ASM 10400 - Introduction To Agricultural Systems

Credit Hours: 3.00. Basic principles of selection and operation of agricultural production equipment, including farm tractors and machines and crop-processing equipment. Planning considerations for crop storage and animal production systems and devices for water conservation and erosion control. Typically offered Fall Spring.

ASM 10500 - Agricultural Systems Computations And Communication

Credit Hours: 3.00. Use of computers to solve problems related to agricultural technology and businesses. Spreadsheets, word processors, and presentation software will be the focus. Emphasis will be on logical problem solving and data presentation using advanced features of office software. A 10000-level number is being used because it is intended as a first-year course. Typically offered Spring.

ASM 21100 - Technical Graphic Communications

Credit Hours: 3.00. Introduction to graphic communication methods using traditional techniques and emphasizing modern computer-based techniques. Topics covered include: free-hand sketching, lettering, and dimensioning; selection of data presentation methods; and plan interpretation and cost calculations. A majority of assignments will include use of commercially available computer-aided drawing packages. Typically offered Fall Spring.

ASM 22100 - Career Opportunities Seminar

Credit Hours: 1.00. An introductory course to acquaint students with career and employment opportunities in the field of agricultural systems management. Guest speakers are invited to share their experiences and philosophies with the students. Special emphasis is given to improving communication skills. Typically offered Fall.

ASM 22200 - Crop Production Equipment

Credit Hours: 3.00. Principles of machine performance, capacity, machinery components, and operation. Study of tractors, trucks, utility vehicles, and combines. Equipment topics include chemical application, tillage tools, planters and seeders, hay and forage

harvesters, electronic monitors and controllers. Computer-based analysis of equipment sizing and systems selection. Typically offered Fall.

ASM 33300 - Facilities Planning And Management

Credit Hours: 3.00. Principles of facility (system) planning and management involving buildings, equipment, and materials handling and flow. Student teams select a case firm (problem) with instructor approval. Principles learned week by week are applied to the development of an overall plan for the complex, over the course of the semester. Case examples can include firms handling supplies, seeds, grains, feeds, chemicals, wastes, and farm produce, as well as farming operations producing grain, forage, and/or livestock products. Students will learn to use AutoCAD to develop drawings, without prior computer drafting experience. Typically offered Spring.

ASM 35000 - Safety In Agriculture

Credit Hours: 1.00. An overview of the agricultural safety movement in the United States with consideration given to the specific human environmental and technological factors influencing farm-related accidents. Special emphasis is given to reduction of unnecessary risks in agricultural production. Course meets during weeks 1-8. Typically offered Spring.

ASM 42100 - Senior Seminar

Credit Hours: 1.00. Professional attitudes and ethics, resume preparation and interview procedures, business correspondence, meetings, and career planning. Typically offered Fall.

ASM 49400 - Project Planning And Management

Credit Hours: 1.00. Discussion of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property, and timelines. Student teams will develop project proposal to address contemporary issues in agricultural systems management. Typically offered Fall.

ASM 49500 - Agricultural Systems Management Capstone Project

Credit Hours: 3.00. Planning, organization, and analysis of individual or team projects related to contemporary issues in agricultural systems management. Typically offered Spring.

Major Selectives (12 credits)

- ASM Selective - Credit Hours: 3.00
- ASM Selective - Credit Hours: 3.00
- ASM Selective - Credit Hours: 3.00
- ASM 40000+ Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (85 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11100 - Introduction To Agricultural And Biological Engineering Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural and Biological Engineering which include Agricultural Systems Management, Agricultural and Natural Resources Engineering, and Biological and Food Process Engineering. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

- Accounting Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00
- Marketing Selective - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (300+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (1 credits)

- Elective - Credit Hours: 1.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11100 - Introduction To Agricultural And Biological Engineering Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural and Biological Engineering which include Agricultural Systems Management, Agricultural and Natural Resources Engineering, and Biological and Food Process Engineering. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ASM 10400 - Introduction To Agricultural Systems

Credit Hours: 3.00. Basic principles of selection and operation of agricultural production equipment, including farm tractors and machines and crop-processing equipment. Planning considerations for crop storage and animal production systems and devices for water conservation and erosion control. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 1st Year

ASM 10500 - Agricultural Systems Computations And Communication

Credit Hours: 3.00. Use of computers to solve problems related to agricultural technology and businesses. Spreadsheets, word processors, and presentation software will be the focus. Emphasis will be on logical problem solving and data presentation using advanced features of office software. A 10000-level number is being used because it is intended as a first-year course. Typically offered Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

- Economics Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

ASM 21100 - Technical Graphic Communications

Credit Hours: 3.00. Introduction to graphic communication methods using traditional techniques and emphasizing modern computer-based techniques. Topics covered include: free-hand sketching, lettering, and dimensioning; selection of data presentation methods; and plan interpretation and cost calculations. A majority of assignments will include use of commercially available computer-aided drawing packages. Typically offered Fall Spring.

ASM 22100 - Career Opportunities Seminar

Credit Hours: 1.00. An introductory course to acquaint students with career and employment opportunities in the field of agricultural systems management. Guest speakers are invited to share their experiences and philosophies with the students. Special emphasis is given to improving communication skills. Typically offered Fall.

ASM 22200 - Crop Production Equipment

Credit Hours: 3.00. Principles of machine performance, capacity, machinery components, and operation. Study of tractors, trucks, utility vehicles, and combines. Equipment topics include chemical application, tillage tools, planters and seeders, hay and forage harvesters, electronic monitors and controllers. Computer-based analysis of equipment sizing and systems selection. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and

interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00

14 Credits

Spring 2nd Year

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

- ASM Selective - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

- Accounting Selective - Credit Hours: 3.00

- ASM Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Marketing Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

ASM 33300 - Facilities Planning And Management

Credit Hours: 3.00. Principles of facility (system) planning and management involving buildings, equipment, and materials handling and flow. Student teams select a case firm (problem) with instructor approval. Principles learned week by week are applied to the development of an overall plan for the complex, over the course of the semester. Case examples can include firms handling supplies, seeds, grains, feeds, chemicals, wastes, and farm produce, as well as farming operations producing grain, forage, and/or livestock products. Students will learn to use AutoCAD to develop drawings, without prior computer drafting experience. Typically offered Spring.

ASM 35000 - Safety In Agriculture

Credit Hours: 1.00. An overview of the agricultural safety movement in the United States with consideration given to the specific human environmental and technological factors influencing farm-related accidents. Special emphasis is given to reduction of unnecessary risks in agricultural production. Course meets during weeks 1-8. Typically offered Spring.

- Agricultural Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

ASM 42100 - Senior Seminar

Credit Hours: 1.00. Professional attitudes and ethics, resume preparation and interview procedures, business correspondence, meetings, and career planning. Typically offered Fall.

ASM 49400 - Project Planning And Management

Credit Hours: 1.00. Discussion of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property, and timelines. Student teams will develop project proposal to address contemporary issues in agricultural systems management. Typically offered Fall.

- ASM Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 3.00

14 Credits

Spring 4th Year

ASM 49500 - Agricultural Systems Management Capstone Project

Credit Hours: 3.00. Planning, organization, and analysis of individual or team projects related to contemporary issues in agricultural systems management. Typically offered Spring.

- ASM 40000+ Selective - Credit Hours: 3.00

- Agricultural Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biological Engineering: Cellular and Biomolecular Engineering Concentration, BSBE

Biological Engineering - multiple concentrations

The world has tremendous need for solutions to problems related to the environment, energy, health, food, and sustainability. Biological systems are related to or at the heart of all of these issues. A biological engineer learns to design and analyze biological systems to develop innovative and practical solutions. Our B.S. graduates are well prepared for careers in the food industry, pharmaceutical industry, biotechnology, and bioprocessing as well as entrance into graduate or medical school. Students may select a major and plan of study within biological engineering that is tailored to their specific career goals. Some areas of focus include:

Cellular and biomolecular engineering: This emerging field is expected to rapidly advance and open opportunities in biomanufacturing, drug design, human therapeutics, tissue and organ regeneration, bioenergy and biofuel production, bioremediation, and biodefense.

Food and Biological process engineering: This is an interdisciplinary field that applies the basic sciences, mathematics, and engineering to convert agricultural commodities into edible foods and biological materials through various processing steps. Advances in genetic engineering lead to new types of crops and new processing methods to create value added products.

Pharmaceutical process engineering: This program of study is targeted to provide graduates with unique skills and job opportunities to take on roles within all phases of the pharmaceutical industry including research, product and process development, processing engineering, manufacturing, and marketing. Watch a video and take a look at some senior projects.

Some of the factors that contribute to Agricultural & Biological Engineering at Purdue University being a top ranked program:

- Multiple opportunities for interaction with faculty in laboratories and in classes
- Student Competitions, Clubs, Global Experiences
- Personalized advising and attention from faculty
- Practical curriculum for industrial careers
- Great opportunities for scholarships and internships
- Excellent placement record and starting salaries

Watch a video and take a look at some senior projects. We hope to see you in ABE soon!

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biological Engineering: Cellular & Biomolecular Engineering include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

Code-BE-BSE
Code-BIEN
Plan Code-CBME
129 Credits for Graduation

Agricultural Engineering Major Courses (129 credits)

Required Major Courses (45 credits)

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow,

Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

ABE 44000 - Cell And Molecular Design Principles

Credit Hours: 3.00. This course examines the design principles underlying the organizations and dynamics of biological networks with an emphasis on genetic/molecular circuits. Topics include the structure and tuning of network motifs and relationship to performance parameters such as robustness to internal noise, temporal response, noise filtering, bi-stability, pattern generation and temporal programs. Examples are presented from the study of natural systems and the design of new synthetic systems. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

Other Departmental /Program Course Requirements (84 credits)

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

or

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena

extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

BIOL 23000 - Biology Of The Living Cell

Credit Hours: 3.00. An introduction to modern cell biology for students who may not have taken a previous college course in biology. All students with the appropriate prerequisites are welcome, and this course will be of special interest to students from engineering, chemistry, physics and computer science. This course will provide a solid foundation in modern cell biology concepts for engineers and students from other disciplines. Typically offered Fall.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

IT 22600 - Biotechnology Laboratory I

Credit Hours: 2.00. Focuses on nucleic acid manipulation. Modules include, making a eukaryotic library, identifying clones, sub-cloning into a bacterial expression vector and verification of the clone's identity by restriction analysis and DNA sequencing. Basic laboratory techniques (solution making, buffer preparation, good safety techniques), sterile technique and compliance procedures. Typically offered Summer Fall Spring.

CNIT 22700 - Introduction To Bioinformatics

Credit Hours: 2.00. Survey course in Bioinformatics for information technology specialists including topics such as: virtual bio-instrumentation, data reduction and mining algorithms and tools, data visualization, pattern matching, modeling and simulation, computational methods, and collaborative application environments. Typically offered Summer Fall Spring.

IT 22700 - Biotechnology Laboratory II

Credit Hours: 2.00. The second laboratory course should use the cloned material to produce a protein. This protein should be purified, utilized immunologically, checked for purity by Edman degradation, and in some kind of bio assay. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science or Science Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

- Written/Oral Communication Selective - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

College of Agriculture and University Level Requirements

College of Agriculture and Univeristy Level Requirements

2.0 GPA required for Bachelor of Science degree

32 Upper division credits taken from Purdue

6 credits International Understanding

3 credits Multicultural Awareness

3 credits Humanities or Social Science Selective 30000+ level

9 credits of Humanities and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

18 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

BIOL 23000 - Biology Of The Living Cell

Credit Hours: 3.00. An introduction to modern cell biology for students who may not have taken a previous college course in biology. All students with the appropriate prerequisites are welcome, and this course will be of special interest to students from engineering, chemistry, physics and computer science. This course will provide a solid foundation in modern cell biology concepts for engineers and students from other disciplines. Typically offered Fall.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

or

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

IT 22600 - Biotechnology Laboratory I

Credit Hours: 2.00. Focuses on nucleic acid manipulation. Modules include, making a eukaryotic library, identifying clones, sub-cloning into a bacterial expression vector and verification of the clone's identity by restriction analysis and DNA sequencing. Basic laboratory techniques (solution making, buffer preparation, good safety techniques), sterile technique and compliance procedures. Typically offered Summer Fall Spring.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

18 Credits

Spring 2nd Year

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

CNIT 22700 - Introduction To Bioinformatics

Credit Hours: 2.00. Survey course in Bioinformatics for information technology specialists including topics such as: virtual bio-instrumentation, data reduction and mining algorithms and tools, data visualization, pattern matching, modeling and simulation, computational methods, and collaborative application environments. Typically offered Summer Fall Spring.

IT 22700 - Biotechnology Laboratory II

Credit Hours: 2.00. The second laboratory course should use the cloned material to produce a protein. This protein should be purified, utilized immunologically, checked for purity by Edman degradation, and in some kind of bio assay. Typically offered Summer Fall Spring.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow, Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

- Biological Science Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with

particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

- Biological Science or Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 4th Year

ABE 44000 - Cell And Molecular Design Principles

Credit Hours: 3.00. This course examines the design principles underlying the organizations and dynamics of biological networks with an emphasis on genetic/molecular circuits. Topics include the structure and tuning of network motifs and relationship to performance parameters such as robustness to internal noise, temporal response, noise filtering, bi-stability, pattern generation and temporal programs. Examples are presented from the study of natural systems and the design of new synthetic systems. Typically offered Spring.

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Note

129 semester credits required for Bachelor of Engineering degree.

Students must have a graduation index of 2.0

Consultation with an advisor may result in an altered plan customized for individual student.

Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

Degree Works is knowledge source for specific requirements and completion

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biological Engineering: Food and Biological Process Engineering, BSBE

Biological Engineering - multiple concentrations

The world has tremendous need for solutions to problems related to the environment, energy, health, food, and sustainability. Biological systems are related to or at the heart of all of these issues. A biological engineer learns to design and analyze biological systems to develop innovative and practical solutions. Our B.S. graduates are well prepared for careers in the food industry, pharmaceutical industry, biotechnology, and bioprocessing as well as entrance into graduate or medical school. Students may select a major and plan of study within biological engineering that is tailored to their specific career goals. Some areas of focus include:

Cellular and biomolecular engineering: This emerging field is expected to rapidly advance and open opportunities in biomanufacturing, drug design, human therapeutics, tissue and organ regeneration, bioenergy and biofuel production, bioremediation, and biodefense.

Food & Biological process engineering: This is an interdisciplinary field that applies the basic sciences, mathematics, and engineering to convert agricultural commodities into edible foods and biological materials through various processing steps. Advances in genetic engineering lead to new types of crops and new processing methods to create value added products.

Pharmaceutical process engineering: This program of study is targeted to provide graduates with unique skills and job opportunities to take on roles within all phases of the pharmaceutical industry including research, product and process development, processing engineering, manufacturing, and marketing. Watch a video and take a look at some senior projects.

Some of the factors that contribute to Agricultural & Biological Engineering at Purdue University being a top ranked program:

- Multiple opportunities for interaction with faculty in laboratories and in classes
- Student Competitions, Clubs, Global Experiences
- Personalized advising and attention from faculty
- Practical curriculum for industrial careers
- Great opportunities for scholarships and internships
- Excellent placement record and starting salaries

Watch a video and take a look at some senior projects. We hope to see you in ABE soon!

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biological Engineering: Food & Biological Engineering include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.
Please see below for program requirements and the necessary degree fulfillments.

code-BE-BSE
Code-BIEN
Plan Code-FBPE
129 Credits for Graduation

Agricultural Engineering Major Courses (129 credits)

Required ABE Courses (45 credits)

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow, Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

Other Departmental /Program Course Requirements (84 credits)

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

or

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the

foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

NUTR 20500 - Food Science I

Credit Hours: 3.00. Chemical and physical composition of foods: their changes during processing, storage, and preparation. Typically offered Fall Spring Summer.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

- Biological or Food Science Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00
- Economics Selectice (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

College of Agriculture and University Level Requirements

- 2.0 GPA required for Bachelor of Science degree.
- 32 Upper division credits taken from Purdue

- 6 credits International Understanding
- 3 credits Multicultural Awareness
- 3 credits of Humanities or Social Science Selective 30000+ level
- 9 credits of Humanities or Social Sciences outside the College of Agriculture

Note

129 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Program Requirements

Fall 1st Year

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

18 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

16 Credits

Fall 2nd Year

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for

biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

or

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

17 Credits

Spring 2nd Year

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical

analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

NUTR 20500 - Food Science I

Credit Hours: 3.00. Chemical and physical composition of foods: their changes during processing, storage, and preparation. Typically offered Fall Spring Summer.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow, Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

16 Credits

Spring 3rd Year

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving

material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00

18 Credits

Fall 4th Year

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

- Written or Oral Communication Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

13 Credits

Spring 4th Year

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

- Biological or Food Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

15 Credits

Note

129 semester credits required for Bachelor of Engineering degree.

Students must have a graduation index of 2.0

Consultation with an advisor may result in an altered plan customized for an individual student.

Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

Degree Works is knowledge source for specific requirements and completion

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biological Engineering: Pharmaceutical Process Engineering, BSBE

Biological Engineering - multiple concentrations

The world has tremendous need for solutions to problems related to the environment, energy, health, food, and sustainability. Biological systems are related to or at the heart of all of these issues. A biological engineer learns to design and analyze biological systems to develop innovative and practical solutions. Our B.S. graduates are well prepared for careers in the food industry, pharmaceutical industry, biotechnology, and bioprocessing as well as entrance into graduate or medical school. Students may select a major and plan of study within biological engineering that is tailored to their specific career goals. Some areas of focus include:

Cellular and biomolecular engineering: This emerging field is expected to rapidly advance and open opportunities in biomanufacturing, drug design, human therapeutics, tissue and organ regeneration, bioenergy and biofuel production, bioremediation, and biodefense.

Food & Biological process engineering: This is an interdisciplinary field that applies the basic sciences, mathematics, and engineering to convert agricultural commodities into edible foods and biological materials through various processing steps. Advances in genetic engineering lead to new types of crops and new processing methods to create value added products.

Pharmaceutical process engineering: This program of study is targeted to provide graduates with unique skills and job opportunities to take on roles within all phases of the pharmaceutical industry including research, product and process development, processing engineering, manufacturing, and marketing. Watch a video and take a look at some senior projects.

Some of the factors that contribute to Agricultural & Biological Engineering at Purdue University being a top ranked program:

- Multiple opportunities for interaction with faculty in laboratories and in classes
- Student Competitions, Clubs, Global Experiences
- Personalized advising and attention from faculty
- Practical curriculum for industrial careers
- Great opportunities for scholarships and internships
- Excellent placement record and starting salaries

Watch a video and take a look at some senior projects. We hope to see you in ABE soon!

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biological Engineering: Pharmaceutical Process Engineering include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.
Please see below for program requirements and the necessary degree fulfillments.

129 Credits for Graduation

Departmental/Program Major Courses (129 credits)

Required Major Courses (45 credits)

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and

process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow, Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

Other Departmental /Program Course Requirements (84 credits)

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course

MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on

applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

IPPH 56200 - Introduction To Pharmaceutical Manufacturing Processes

Credit Hours: 4.00. A course intended to provide the student with basic understanding of both the theoretical and practical aspects of pharmaceutical manufacturing by combining a thorough classroom treatment of the underlying principles of each pharmaceutical unit operation with hands-on execution of these activities in the laboratory. Permission of instructor required. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and

research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

- Written or Oral Communications Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00 (satisfies Human Culture Behavioral/Social Science for core)
- UCC Humanities Selective - Credit Hours: 3.00 (satisfies Human Cultures Humanities for core)
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science Selective
- Science Selective
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

College of Agriculture and University Level Requirements

- 2.0 GPA required for Bachelor of Science degree.
- 32 Upper division credits taken from Purdue
- 6 credits International Understanding
- 3 credits Multicultural Awareness
- 3 credits of Humanities or Social Science Selective 30000+ level
- 9 credits of Humanities or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

18 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

CS 15900 - Programming Applications For Engineers

Credit Hours: 3.00. Fundamental principles, concepts, and methods of programming (C and MATLAB), with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. Students are expected to complete assignments in a collaborative learning environment. Typically offered Summer Fall Spring.

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

ABE 20100 - Thermodynamics In Biological Systems I

Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design. Typically offered Fall.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

and

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

17 Credits

Spring 2nd Year

ABE 20200 - Thermodynamics In Biological Systems II

Credit Hours: 3.00. Thermodynamic principles and their applications to biochemical and biological systems with emphasis on the second law of thermodynamics and use of molecular interpretations of energies and entropies. Concept of entropy balances and process efficiency. Free energy and chemical equilibrium. Equilibrium between phases, colligative properties, binding of ligands and formation of biological membrances. Molecular motion and transport properties and their application in biochemical analytical methods. Development of physical chemical problem solving skills using MathCad and MatLab software. Typically offered Spring.

CHE 32000 - Statistical Modeling And Quality Enhancement

Credit Hours: 3.00. Statistical modeling methods, design of experiments, error analysis, curve fitting and regression, analysis of variance, confidence intervals, quality control and enhancement: emphasizes preparation for designing chemical engineering laboratory experiments and analyzing data. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

- Humanities or Social Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

ABE 30300 - Applications Of Physical Chemistry To Biological Processes

Credit Hours: 3.00. Physical chemical principles associated with transport of mass, momentum and energy in bioprocesses. Principles for measuring physical chemical properties, a description of predictive equations for their evaluation and the role of these principles in the design and optimization of bioprocesses. Typically offered Fall.

ABE 30700 - Momentum Transfer In Food And Biological Systems

Credit Hours: 3.00. Fluid statics, Newton's law of viscosity, shell momentum balances, equations of continuity and motion, one dimensional flow problems, flow through porous media, velocity distributions with more than one independent variable, two dimensional flow through a channel, stream function, velocity potential, dimensional analysis, boundary layer, turbulent flow, Reynolds stress, form and skin friction, application of macroscopic momentum and mechanical energy balances to engineering problems. Typically offered Fall Spring.

ABE 37000 - Biological/Microbial Kinetics And Reaction Engineering

Credit Hours: 3.00. Study of the rates of chemical/biochemical reaction and catalysis in agricultural, food, and biological systems with applications to engineering process design. Applications include microbial growth, enzyme catalysis, fermentation and reactor design. Introductory enzymatic and microbial reaction concepts will be taught and incorporated into reactor design. Typically offered Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences

Credit Hours: 3.00. This is a methods course for juniors in any branch of engineering and science, designed to follow MA 26200. Basic techniques for solving systems of linear ordinary differential equations. Series solutions for second order equations, including Bessel functions, Laplace transform, Fourier series, numerical methods, separation of variables for partial differential equations and Sturm-Liouville theory. Not open to students with credit in MA 30400. Typically offered Fall Spring Summer.

16 Credits

Spring 3rd Year

ABE 30100 - Numerical And Computational Modeling In Biological Engineering

Credit Hours: 3.00. Introduction to principles of analysis, setup, and modeling of biological systems using fundamental principles of engineering. Development of mathematical and numerical models to solve steady state and transient processes involving material and energy balances and utilizing thermodynamic, transport, and kinetic reaction principles, and economics in biological engineering systems. Typically offered Fall Spring.

ABE 30400 - Bioprocess Engineering Laboratory

Credit Hours: 3.00. Laboratory course focused on bioprocessing topics such as fluid flow, mixing, rheology, hydrolysis, and fermentation of biomaterials. Students will participate in design of experiments, system set up, data collection, statistical data analysis, and presentation of results. Typically offered Spring.

ABE 30800 - Heat And Mass Transfer In Food And Biological Systems

Credit Hours: 3.00. Principles of transport of energy and mass. Mechanisms of heat transfer, heat conduction, heat convection and heat radiation. Development of applications using macroscopic and microscopic balances of energy. Application of thermal energy balances and Fourier's Law to describe steady state and transient conduction applications including heat generation. Effect of the geometry on these processes. Basic principles of design of heat transfer equipment and its operation. Application of species mass balances and Fick's Law to steady state and transient diffusion problems. Effect of geometry on these processes. Analogies between transport of momentum, heat and mass applications to the solution of practical problems in the Food Process and Biological Engineering fields. Typically offered Spring.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 45700 - Transport Operations In Food And Biological Engineering I

Credit Hours: 3.00. Application of momentum and heat transfer to biological and food process engineering. Viscosity, non-Newtonian fluids, experimental methods of rheological characterization of food and biological systems; viscoelasticity; design equations for pipe flow, pumps, mixing, emulsification, extrusion, sheeting, heat exchanges, aseptic processing, sterilization, freezing, and evaporation. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00

18 Credits

Fall 4th Year

ABE 46000 - Sensors And Process Control

Credit Hours: 3.00. Fundamental aspects of transducers, biosensors, instrumentation, and computer control are presented, with particular emphasis on sensors and controls used in agricultural, biological, and food applications. Laboratory and pilot plant scale computer controlled equipment is used to examine response of process variables, sensor calibration, control system modeling, and controller selection and tuning. Prereq: differential equations and a course in either heat transfer or fluid mechanics. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

ABE 55700 - Transport Operations In Food And Biological Systems II

Credit Hours: 3.00. Course includes analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs, integration of pilot plant results into the design , operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Typically offered Fall.

IPPH 56200 - Introduction To Pharmaceutical Manufacturing Processes

Credit Hours: 4.00. A course intended to provide the student with basic understanding of both the theoretical and practical aspects of pharmaceutical manufacturing by combining a thorough classroom treatment of the underlying principles of each pharmaceutical unit operation with hands-on execution of these activities in the laboratory. Permission of instructor required. Typically offered Fall.

- Written or Oral Communication Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 4th Year

ABE 55800 - Process Design For Food And Biological Systems

Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports. Typically offered Fall.

ABE 58000 - Process Engineering Of Renewable Resources

Credit Hours: 3.00. Physical and chemical structure of biomass. Reaction kinetics of hydrolysis of hemicellulose and cellulose to fermentable sugars. Fundamentals of ethanol production by fermentation. Separation of fermentation products into pure components. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

12 Credits

Requirements

129 semester credits required for Bachelor of Science degree.

Students must have a graduation index of 2.0

The student is ultimately responsible for knowing and completing all degree requirements.

Consultation with an advisor may result in an altered plan customized for a student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Environmental and Natural Resources Engineering, BSAGE

About the Program

In Environmental and Natural Resources Engineering, students learn about ecosystem processes (the water cycle, nutrient transformation processes, and biological systems), how human activities such as agriculture affect these complex systems, and how to design sustainable solutions. Basic engineering principles, as well as some of the newest technological approaches, are applied to solve challenges related to soil and plant environments, surface and ground water quality, air quality, animal environments, and food safety. Graduates work in exciting careers in federal, state, and local government, engineering consulting firms, and industry, or pursue graduate study opportunities.

Some of the factors that contribute to Agricultural & Biological Engineering at Purdue University being a top ranked program:

- Multiple opportunities for interaction with faculty in laboratories and in classes
- Student Competitions, Clubs, Global Experiences
- Personalized advising and attention from faculty
- Practical curriculum for industrial careers
- Great opportunities for scholarships and internships
- Excellent placement record and starting salaries

Watch a video and then take a look at some senior projects.

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Environmental and Natural Resource Engineering include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

Departmental/Program Major Courses (126 credits)

Required Major Courses (28 credits)

ABE 20500 - Computations For Engineering Systems

Credit Hours: 3.00. Development of engineering problem solving and design skills. Use of Excel, Matlab, and MathCad for problem solving, data analysis, numerical modeling, and statistics. Introduction to elementary statics, dynamics, materials, thermodynamics, fluid mechanics, and energy topics. Typically offered Fall.

ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems

Credit Hours: 3.00. Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production. Typically offered Spring.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

ABE 30500 - Physical Properties Of Biological Materials

Credit Hours: 3.00. Physical properties of agricultural crops and food products and their relationship to harvesting, storage, and processing. Physical properties covered include: density, shape, moisture content, water potential, water activity, friction and flow or particulate solids, terminal velocity, thermal properties, interaction with electromagnetic radiation, and viscoelastic behavior of solids. Typically offered Fall.

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

ABE 33000 - Design Of Machine Components

Credit Hours: 3.00. Introduction to design; stress analysis; deformation and stiffness considerations; static and fatigue strength design; design of components of the food processing, farm and off-highway machines, and mechanical systems. Typically offered Spring.

ABE 45000 - Finite Element Method In Design And Optimization

Credit Hours: 3.00. Fundamentals of the finite element method as it is used in modeling, analysis, and design of thermal/fluid and mechanical systems; one- and two-dimensional elements; boundary value problems, heat transfer and fluid flow problems; structural and solid mechanics problems involving beam, truss, plate and shell elements; computer-aided design and optimization of machine components, structural elements and thermal/fluid system. Typically offered Fall.

ABE 48400 - Project Planning And Management

Credit Hours: 1.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Fall.

ABE 48600 - Agricultural Engineering Design

Credit Hours: 3.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Spring.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

Other Departmental /Program Course Requirements (98 credits)

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

CE 34000 - Hydraulics

Credit Hours: 3.00. Fluid properties; hydrostatics; kinematics and dynamics of fluid flows; conservation of mass, energy, and momentum; flows in pipes and open channels. Formal laboratory experiments. Typically offered Summer Fall Spring.

CE 34300 - Elementary Hydraulics Laboratory

Credit Hours: 1.00. The laboratory covers basic concepts in analysis of experimental data and methods in hydraulic measurements. A variety of simple laboratory experiments illustrating the principles of hydraulics are performed. Typically offered Summer Fall Spring.

or

ME 30900 - Fluid Mechanics

Credit Hours: 4.00. Continuum, velocity field, fluid statics, manometers, basic conservation laws for systems and control volumes, dimensional analysis. Euler and Bernoulli equations, viscous flows, boundary layers, flow in channels and around submerged bodies, one-dimensional gas dynamics, turbomachinery. Typically offered Fall Spring.

ME 27000 - Basic Mechanics I

Credit Hours: 3.00. Vector operations, forces and couples, free body diagrams, equilibrium of a particle and of rigid bodies. Friction. Distributed forces. Centers of gravity and centroids. Applications from structural and machine elements, such as bars,

trusses, and friction devices. Kinematics and equations of motion of a particle for rectilinear and curvilinear motion. Typically offered Fall Spring Summer.

ME 27400 - Basic Mechanics II

Credit Hours: 3.00. Review and extension of particle motion to include energy and momentum principles. Planar kinematics of rigid bodies. Kinetics for planar motion of rigid bodies, including equations of motion and principles of energy and momentum. Three-dimensional kinematics and kinetics of rigid bodies. Linear vibrations, with emphasis on single-degree-of-freedom systems. Typically offered Fall Spring Summer.

NUCL 27300 - Mechanics Of Materials

Credit Hours: 3.00. Analysis of stress and strain; equations of equilibrium and compatibility; stress-strain laws; extension, torsion, and bending of bars; membrane theory of pressure vessels; combined loading conditions; transformation of stresses and principal stresses; elastic stability, elected topics. Typically offered Fall Spring Summer.

- Engineering Technical Selective - Credit Hours: 3.00
- Engineering Technical Selective - Credit Hours: 3.00
- ENRE Technical Selective - Credit Hours: 3.00
- ENRE Technical Selective - Credit Hours: 3.00

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

- Agricultural Selective - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative

and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

- Written and Oral Communication Selective - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

Electives (2 credits)

- Elective - Credit Hours: 2.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree.
- 32 Upper division credits taken from Purdue
- 6 credits International Understanding
- 3 credits Multicultural Awareness
- 3 credits of Hum or Social Sciences 30000+ level
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

128 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

Program Requirements

Fall 1st Year

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENGR 13100 - Transforming Ideas To Innovation I

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering, introduces students to the engineering professions using multidisciplinary, societally relevant content. Developing engineering approaches to systems, generating and exploring creative ideas, and use of quantitative methods to support design decisions. Explicit model-development activities (engineering eliciting activities, EEAs) engage students in innovative thinking across the engineering disciplines at Purdue. Experiencing the process of design and analysis in engineering including how to work effectively in teams. Developing skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16500 - Analytic Geometry And Calculus I

Credit Hours: 4.00. Introduction to differential and integral calculus of one variable, with applications. Conic sections. Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B", but are not qualified to enter MA 16200 or MA 16600, or the advanced placement courses MA 17300 or MA 27100 , or the honors calculus course MA 18100. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring. CTL:IMA 1602 Calculus - Long I

- UCC Approved Humanities Selective - Credit Hours: 3.00

17 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

ENGR 13200 - Transforming Ideas To Innovation II

Credit Hours: 2.00. A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel and MATLAB). Typically offered Fall Spring Summer.

MA 16600 - Analytic Geometry And Calculus II

Credit Hours: 4.00. Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus - Long II

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

17 Credits

Fall 2nd Year

ABE 20500 - Computations For Engineering Systems

Credit Hours: 3.00. Development of engineering problem solving and design skills. Use of Excel, Matlab, and MathCad for problem solving, data analysis, numerical modeling, and statistics. Introduction to elementary statics, dynamics, materials, thermodynamics, fluid mechanics, and energy topics. Typically offered Fall.

ABE 29000 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural and biological engineering issues will be discussed by students, staff, and guest speakers. Career planning, employment opportunities, professionalism, ethics, and improvement of communication skills will be emphasized. Typically offered Fall.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

ME 27000 - Basic Mechanics I

Credit Hours: 3.00. Vector operations, forces and couples, free body diagrams, equilibrium of a particle and of rigid bodies. Friction. Distributed forces. Centers of gravity and centroids. Applications from structural and machine elements, such as bars, trusses, and friction devices. Kinematics and equations of motion of a particle for rectilinear and curvilinear motion. Typically offered Fall Spring Summer.

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

- Economics Selective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems

Credit Hours: 3.00. Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production. Typically offered Spring.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

ME 27400 - Basic Mechanics II

Credit Hours: 3.00. Review and extension of particle motion to include energy and momentum principles. Planar kinematics of rigid bodies. Kinetics for planar motion of rigid bodies, including equations of motion and principles of energy and momentum. Three-dimensional kinematics and kinetics of rigid bodies. Linear vibrations, with emphasis on single-degree-of-freedom systems. Typically offered Fall Spring Summer.

NUCL 27300 - Mechanics Of Materials

Credit Hours: 3.00. Analysis of stress and strain; equations of equilibrium and compatibility; stress-strain laws; extension, torsion, and bending of bars; membrane theory of pressure vessels; combined loading conditions; transformation of stresses and principal stresses; elastic stability, elected topics. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00

17 Credits

Fall 3rd Year

ABE 30500 - Physical Properties Of Biological Materials

Credit Hours: 3.00. Physical properties of agricultural crops and food products and their relationship to harvesting, storage, and processing. Physical properties covered include: density, shape, moisture content, water potential, water activity, friction and flow or particulate solids, terminal velocity, thermal properties, interaction with electromagnetic radiation, and viscoelastic behavior of solids. Typically offered Fall.

ABE 32500 - Soil And Water Resource Engineering

Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

CE 34000 - Hydraulics

Credit Hours: 3.00. Fluid properties; hydrostatics; kinematics and dynamics of fluid flows; conservation of mass, energy, and momentum; flows in pipes and open channels. Formal laboratory experiments. Typically offered Summer Fall Spring.

CE 34300 - Elementary Hydraulics Laboratory

Credit Hours: 1.00. The laboratory covers basic concepts in analysis of experimental data and methods in hydraulic measurements. A variety of simple laboratory experiments illustrating the principles of hydraulics are performed. Typically offered Summer Fall Spring.

or

ME 30900 - Fluid Mechanics

Credit Hours: 4.00. Continuum, velocity field, fluid statics, manometers, basic conservation laws for systems and control volumes, dimensional analysis. Euler and Bernoulli equations, viscous flows, boundary layers, flow in channels and around submerged bodies, one-dimensional gas dynamics, turbomachinery. Typically offered Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00

17 Credits

Spring 3rd Year

ABE 31400 - Design Of Electronic Systems

Credit Hours: 3.00. Fundamental aspects of circuits, microprocessors, transducers, sensors, instrumentation, and data acquisition

are presented, with particular emphasis on electronic systems used in agricultural, biological, and food applications. Laboratory exercises used to apply the course material to constructing and testing circuits, microprocessor controlled systems, and the data collection and monitoring of systems. Typically offered Spring.

ABE 33000 - Design Of Machine Components

Credit Hours: 3.00. Introduction to design; stress analysis; deformation and stiffness considerations; static and fatigue strength design; design of components of the food processing, farm and off-highway machines, and mechanical systems. Typically offered Spring.

- ENRE Technical Selective - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00
- Agricultural Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

ABE 45000 - Finite Element Method In Design And Optimization

Credit Hours: 3.00. Fundamentals of the finite element method as it is used in modeling, analysis, and design of thermal/fluid and mechanical systems; one- and two-dimensional elements; boundary value problems, heat transfer and fluid flow problems; structural and solid mechanics problems involving beam, truss, plate and shell elements; computer-aided design and optimization of machine components, structural elements and thermal/fluid system. Typically offered Fall.

ABE 48400 - Project Planning And Management

Credit Hours: 1.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Fall.

ABE 49000 - Professional Practice In Agricultural And Biological Engineering

Credit Hours: 1.00. Career areas in agricultural engineering; job opportunities and graduate study; professional attitudes and ethics; contracts and specifications; patents. Typically offered Fall.

- ENRE Technical Selective - Credit Hours: 3.00
- Engineering Technical Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

14 Credits

Spring 4th Year

ABE 48600 - Agricultural Engineering Design

Credit Hours: 3.00. Review of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property rights, contracts and timelines. Students will select a Capstone project and assemble a project proposal within a team environment. Typically offered Spring.

- Engineering Technical Selective - Credit Hours: 3.00
- Humanities or Social Selective - Credit Hours: 2.00
- Humanities or Social Selective (30000+) - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

13 Credits

Note

128 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Systems Management Minor

18 credits

Required Courses

ASM 10400 - Introduction To Agricultural Systems

Credit Hours: 3.00. Basic principles of selection and operation of agricultural production equipment, including farm tractors and machines and crop-processing equipment. Planning considerations for crop storage and animal production systems and devices for water conservation and erosion control. Typically offered Fall Spring.

ASM 10500 - Agricultural Systems Computations And Communication

Credit Hours: 3.00. Use of computers to solve problems related to agricultural technology and businesses. Spreadsheets, word processors, and presentation software will be the focus. Emphasis will be on logical problem solving and data presentation using advanced features of office software. A 10000-level number is being used because it is intended as a first-year course. Typically offered Spring.

Selective List

(12 credits from the following)*

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGRY 37500 - Crop Production Systems

Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ASM 20100 - Construction And Maintenance

Credit Hours: 3.00. Fundamental principles in the selection and use of tools for the construction and maintenance of agricultural and related facilities, equipment, and machines. Areas covered include small engines, concrete and masonry, wood, plumbing, electricity, and metal. Typically offered Fall Spring.

ASM 21100 - Technical Graphic Communications

Credit Hours: 3.00. Introduction to graphic communication methods using traditional techniques and emphasizing modern computer-based techniques. Topics covered include: free-hand sketching, lettering, and dimensioning; selection of data presentation methods; and plan interpretation and cost calculations. A majority of assignments will include use of commercially available computer-aided drawing packages. Typically offered Fall Spring.

ASM 22200 - Crop Production Equipment

Credit Hours: 3.00. Principles of machine performance, capacity, machinery components, and operation. Study of tractors, trucks, utility vehicles, and combines. Equipment topics include chemical application, tillage tools, planters and seeders, hay and forage harvesters, electronic monitors and controllers. Computer-based analysis of equipment sizing and systems selection. Typically offered Fall.

ASM 24500 - Materials Handling And Processing

Credit Hours: 3.00. Principles of materials handling and processing. Physical properties and characteristics of food, fiber, and feed materials as related to harvesting, handling, processing, and storage. Processing of agricultural materials including drying, preservation, size reduction (e.g. grinding, crushing, shredding), mixing and blending, refrigeration, extrusion, and pelleting. Conveying and transport systems with consideration of their effects on damage and quality. The course elements are tied together by a treatment of scheduling and coordination of biologically based systems, which involve production, handling, quality control, and processing. Typically offered Spring.

ASM 33300 - Facilities Planning And Management

Credit Hours: 3.00. Principles of facility (system) planning and management involving buildings, equipment, and materials handling and flow. Student teams select a case firm (problem) with instructor approval. Principles learned week by week are applied to the development of an overall plan for the complex, over the course of the semester. Case examples can include firms handling supplies, seeds, grains, feeds, chemicals, wastes, and farm produce, as well as farming operations producing grain, forage, and/or livestock products. Students will learn to use AutoCAD to develop drawings, without prior computer drafting experience. Typically offered Spring.

ASM 33600 - Environmental Systems Management

Credit Hours: 3.00. Analysis of environmental systems with special emphasis on non-urban and agribusiness needs. Technological and sociological solutions to environmental problems. Computer-based tools are used to analyze global environmental issues, chemical use and management, waste disposal and management, water and air quality, soil and water conservation, sustainable agriculture, regulatory and policy issues. Typically offered Fall.

ASM 34500 - Power Units And Power Trains

Credit Hours: 3.00. An introduction to power generation and transfer in mechanical and fluid power systems. Internal combustion engines, fuels, and cycles are introduced. Clutches, mechanical transmissions, automatic transmissions, hydrostatic transmissions, and final drives are discussed. Principles of hydraulics, fluids, cylinders, pumps, motors, valves, hoses, filters, reservoirs, and accumulators are studied. Typically offered Fall.

ASM 42000 - Electric Power And Controls

Credit Hours: 3.00. Fundamentals and application of electric power for agricultural facilities; safe wiring principles; operation and performance characteristics of electric motors; applications of control systems that include monitors, sensors, relays, and programmable logic controllers. Typically offered Fall.

ASM 42200 - Advanced Machine Technology For Agricultural Crop Production

Credit Hours: 3.00. The course examines technologies and techniques associated with modern farming practices often referred to in general as precision agriculture. It is structured to center around expert presentations from industry, academia, and farming practice, with a focus on technologies and appropriate application of such technologies in crop production systems in the Eastern Cornbelt. Consent of instructor required. Typically offered Spring.

ASM 49900 - Thesis Research

Credit Hours: 1.00 to 6.00. Thesis Research. Admission to honors program. Permission of instructor required. Typically offered Fall Spring Summer.

ASM 51000 - Agrosecurity-Emergency Management For Agricultural Production Operations

Credit Hours: 3.00. Prepares individuals for management and loss control positions in agricultural production, agribusiness operations, and emergency management agencies. Addresses prevention, preparation, mitigation, response, and recovery from disasters such as fires, explosions, entrapments, tornadoes, floods, winter storms, earthquakes, vandalism, chemical releases, and bio-terrorism. Students complete a community service learning activity, in which they assist a farm or agribusiness manager in developing formal emergency preparedness plans. Typically offered Fall.

ASM 53000 - Power And Machinery Management

Credit Hours: 3.00. Management and selection of farm machines and power units with emphasis on cost analysis and evaluation of new machines and practices. Typically offered Fall.

ASM 54000 - Geographic Information System Application

Credit Hours: 3.00. Fundamentals of GIS analysis applied to environmental, agricultural, and engineering-related problems. Topics include data sources, spatial analysis; projections; creating data and metadata, and conceptualizing and solving spatial problems using GIS. Typically offered Fall.

ASM 55000 - Grain Drying And Storage

Credit Hours: 3.00. Crop drying and storage principles including equilibrium moisture, psychrometrics, and drying rates. Modern drying and conditioning techniques including dryeration, in-bin counterflow drying, and combination drying. Estimating fixed and variable drying costs, aeration of stored grain, and maintenance of grain quality. Offered in even-numbered years. Typically offered Spring.

ASM 59000 - Special Problems

Credit Hours: 1.00 to 6.00. Assignment by consent of the instructor in the field of selected study. Laboratory, field, and library studies and reports on special problems related to agricultural systems management not covered in regular coursework. Permission of instructor required. Typically offered Fall Spring Summer.

ASM 59100 - Special Topics

Credit Hours: 1.00 to 4.00. Primarily designed for specialized topic areas in agricultural systems management for which there is no specific course, workshop, or individual study plan, but having enough student interest to justify the formalized teaching of a course. Permission of instructor required. Typically offered Fall Spring Summer.

Notes

Department Permission is not required to enroll in this minor.

*Only three credits may be from courses other than Agricultural Systems Management (ASM). At least six credits must be 30000+ level courses. No more than 6 credits of special problems (ASM 49000 and/or 59000) may apply to the minor and application of the special problems to the minor must be stated on the course contract form.

Department of Agricultural Economics

Overview

The Department of Agricultural Economics has a long history of preparing students for careers in the food and agricultural industry as well as preparation for graduate and law school. The variation of majors offers students the opportunity to focus in agribusiness, economics, sales and marketing, or farm management.

Students have the opportunity to learn from faculty who lead the department's Center for Food and Agricultural Business and the Center for Commercial Agriculture. The Center for Food and Agricultural Business combines research with real-world applications to offer seminars, workshops, and custom programs to the same companies that are hiring our undergraduate students for internships and full-time positions. The Center for Commercial Agriculture has a vision to "be the leading source of management education and knowledge generation for farmers" bringing a wealth of experienced faculty to guide students interested in a career path in production agriculture.

Students are advised by a passionate group of academic advisors who encourage students to enhance their Purdue experience by participating in transformational experiences. These experiences range from attending a national or campus leadership conference, studying abroad, competing in an academic competition, completing an undergraduate research project, serving as an officer in one of the numerous campus organizations, etc.

Department of Agricultural Economics Website

Faculty

https://ag.purdue.edu/agecon/Pages/directory_faculty.aspx

Contact Information

Department of Agricultural Economics

Purdue University

Krannert Building
403 West State Street
West Lafayette, IN 47907
Phone: (765) 494-4191
Email: LeeAnn Williams

Website: https://ag.purdue.edu/agecon/Pages/default.aspx

The Main office for the department is located in Room 681 of the KRAN Building.

Graduate Information

For Graduate Information please see Agricultural Economics Graduate Program Information.

Agribusiness: Agribusiness Management Concentration, BS

About the Program

Increasing opportunities exist for agricultural graduates to enter managerial positions in business. These businesses may be large or small and may be organized as proprietorships, partnerships, corporations, or cooperatives. They include meat, dairy, and poultry processing industries, grain handling, feed manufacturing, and seed and fertilizer firms; transportation and storage concerns; and wholesale and retail food businesses. Although this Department of Agricultural Economics curriculum gives special emphasis to agriculturally related businesses, its requirements are broad enough to allow adequate preparation for nonagricultural businesses. This option also has enough flexibility to permit you to prepare for an international career in agricultural business and can serve as a foundation for graduate school.

Concentrations include:

- Agribusiness Management
- Agrifinance
- Agrimarketing
- Commodity Marketing
- Food Marketing

Agribusiness (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agribusiness: Agribusiness Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (103 credits)

Required Major Courses (27 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure

monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

Major Selectives - Select 1 of the following courses (3 credits)

- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (73 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00
- Mathematics or Science Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Human Relations Management Selective - Credit Hours: 3.00
- Industrial Technology Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative

and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (17 credits)

- Elective - Credit Hours: 17.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Human Relations Management Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms,

linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Industrial Technology Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Math/Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

- Agricultural Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

14 Credits

Spring 4th Year

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agribusiness: Agricultural Finance Concentration, BS

About the Program

Increasing opportunities exist for agricultural graduates to enter managerial positions in business. These businesses may be large or small and may be organized as proprietorships, partnerships, corporations, or cooperatives. They include meat, dairy, and poultry processing industries, grain handling, feed manufacturing, and seed and fertilizer firms; transportation and storage concerns; and wholesale and retail food businesses. Although this Department of Agricultural Economics curriculum gives special emphasis to agriculturally related businesses, its requirements are broad enough to allow adequate preparation for nonagricultural businesses. This option also has enough flexibility to permit you to prepare for an international career in agricultural business and can serve as a foundation for graduate school.

Concentrations include:

- Agribusiness Management
- Agrifinance
- Agrimarketing
- Commodity Marketing
- Food Marketing

Agribusiness (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agribusiness: Agricultural Finance include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (103 credits)

Required Major Courses (33 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42500 - Estate Planning And Property Transfer

Credit Hours: 3.00. The ownership and transfer of farm business property. Includes tax and other implications of life estates, trust arrangements, sale of property, and charitable contributions. Typically offered Fall.

AGEC 45600 - Federal Income Tax Law

Credit Hours: 3.00. Introduction to the federal income tax laws applicable to individuals and small business with emphasis on the farming business. The course includes management implications and the policy basis for the tax law system. Techniques and practice for the preparation of selected forms will be included. There will be limited exposure to taxation of partnerships, corporations, estates, and to federal gift and estate tax law. Typically offered Spring.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

AGEC 52400 - Agricultural Finance

Credit Hours: 3.00. Designed to provide students the concepts and tools to apply financial management principles to farm businesses. Topics include financing alternatives, preparation and interpretation of financial statements, and capital investment analysis using discounted cash flows. Typically offered Spring.

Major Selectives - Select 1 of the following courses (3 credits)

- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (67 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20100 - Management Accounting I

Credit Hours: 3.00. An introduction to management's internal use of accounting information--for decision making, production management, product costing, motivating and evaluating performance, and budgeting. Typically offered Fall Spring Summer. CCN:IPO 1802 Accounting II

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00
- Mathematics or Science Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (17 credits)

- Elective - Credit Hours: 17.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2

- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

MGMT 20100 - Management Accounting I

Credit Hours: 3.00. An introduction to management's internal use of accounting information--for decision making, production management, product costing, motivating and evaluating performance, and budgeting. Typically offered Fall Spring Summer. CCN:IPO 1802 Accounting II

- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- Agricultural Economics Selective - Credit Hours: 3.00

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Math/Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 42500 - Estate Planning And Property Transfer

Credit Hours: 3.00. The ownership and transfer of farm business property. Includes tax and other implications of life estates, trust arrangements, sale of property, and charitable contributions. Typically offered Fall.

AGEC 45600 - Federal Income Tax Law

Credit Hours: 3.00. Introduction to the federal income tax laws applicable to individuals and small business with emphasis on the farming business. The course includes management implications and the policy basis for the tax law system. Techniques and practice for the preparation of selected forms will be included. There will be limited exposure to taxation of partnerships, corporations, estates, and to federal gift and estate tax law. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

14 Credits

Spring 4th Year

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

AGEC 52400 - Agricultural Finance

Credit Hours: 3.00. Designed to provide students the concepts and tools to apply financial management principles to farm businesses. Topics include financing alternatives, preparation and interpretation of financial statements, and capital investment analysis using discounted cash flows. Typically offered Spring.

- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Elective - Credit Hour: 3.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agribusiness: Agricultural Marketing Concentration, BS

About the Program

Increasing opportunities exist for agricultural graduates to enter managerial positions in business. These businesses may be large or small and may be organized as proprietorships, partnerships, corporations, or cooperatives. They include meat, dairy, and poultry processing industries, grain handling, feed manufacturing, and seed and fertilizer firms; transportation and storage concerns; and wholesale and retail food businesses. Although this Department of Agricultural Economics curriculum gives special emphasis to agriculturally related businesses, its requirements are broad enough to allow adequate preparation for nonagricultural businesses. This option also has enough flexibility to permit you to prepare for an international career in agricultural business and can serve as a foundation for graduate school.

Concentrations include:

- Agribusiness Management
- Agrifinance
- Agrimarketing
- Commodity Marketing
- Food Marketing

Agribusiness (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agribusiness: Agricultural Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (103 credits)

Required Major Courses (32 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure

monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of

principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

AGEC 42900 - Agribusiness Marketing Workshop

Credit Hours: 2.00. Research, development, and presentation of a strategic agribusiness marketing plan. Permission of instructor required. Typically offered Spring.

Major Selectives (6 credits)

- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (64 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00
- Mathematics or Science Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (18 credits)

- Elective - Credit Hours: 18.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies,

preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- Agricultural economics Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Math/Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours 3.00

15 Credits

Fall 4th Year

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

- Economics Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits

Spring 4th Year

AGEC 42900 - Agribusiness Marketing Workshop

Credit Hours: 2.00. Research, development, and presentation of a strategic agribusiness marketing plan. Permission of instructor required. Typically offered Spring.

- Agricultural Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agribusiness: Commodity Marketing Concentration, BS

About the Program

Increasing opportunities exist for agricultural graduates to enter managerial positions in business. These businesses may be large or small and may be organized as proprietorships, partnerships, corporations, or cooperatives. They include meat, dairy, and poultry processing industries, grain handling, feed manufacturing, and seed and fertilizer firms; transportation and storage concerns; and wholesale and retail food businesses. Although this Department of Agricultural Economics curriculum gives special emphasis to agriculturally related businesses, its requirements are broad enough to allow adequate preparation for nonagricultural businesses. This option also has enough flexibility to permit you to prepare for an international career in agricultural business and can serve as a foundation for graduate school.

Concentrations include:

- Agribusiness Management
- Agrifinance
- Agrimarketing
- Commodity Marketing
- Food Marketing

Agribusiness (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agribusiness: Commodity Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (103 credits)

Required Major Courses (39 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 30500 - Agricultural Prices

Credit Hours: 3.00. Analysis of prices and the movement of farm product prices; relations of farm product prices to farm input and other prices; conceptual and statistical analysis of agricultural supply and demand relationships; application of price analysis, price forecasting, agricultural outlook, agricultural policy; adjustment of farming to new price conditions. Typically offered Fall.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

Major Selectives (3 credits)

- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (61 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Agry or Animal Science Selective at 20000+ - Credit Hours: 3.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00
- Mathematics or Science Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 4.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (17 credits)

- Elective - Credit Hours: 17.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations,

career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

- Food and Agribusiness Management Selective - Credit Hours: 4.00
- Math/Science Selective - Credit Hours: 3.00
- Agry or Animal Science Selective at 20000+ - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 30500 - Agricultural Prices

Credit Hours: 3.00. Analysis of prices and the movement of farm product prices; relations of farm product prices to farm input and other prices; conceptual and statistical analysis of agricultural supply and demand relationships; application of price analysis, price forecasting, agricultural outlook, agricultural policy; adjustment of farming to new price conditions. Typically offered Fall.

- Agricultural Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

14 Credits

Spring 4th Year

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

- Economics Selective - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agribusiness: Food Marketing Concentration, BS

About the Program

Increasing opportunities exist for agricultural graduates to enter managerial positions in business. These businesses may be large or small and may be organized as proprietorships, partnerships, corporations, or cooperatives. They include meat, dairy, and poultry processing industries, grain handling, feed manufacturing, and seed and fertilizer firms; transportation and storage concerns; and wholesale and retail food businesses. Although this Department of Agricultural Economics curriculum gives special emphasis to agriculturally related businesses, its requirements are broad enough to allow adequate preparation for nonagricultural businesses. This option also has enough flexibility to permit you to prepare for an international career in agricultural business and can serve as a foundation for graduate school.

Concentrations include:

- Agribusiness Management
- Agrifinance
- Agrimarketing
- Commodity Marketing
- Food Marketing

Agribusiness (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agribusiness: Food Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (102 credits)

Required Major Courses (33 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 33300 - Food Distribution - A Retailing Perspective

Credit Hours: 3.00. Distribution factors that affect the food industry. Particular attention to the food wholesaling and retailing sectors. Presentation of economic tools to evaluate performance in the food industry. Discussion of the relative importance of each of the major departments in the modern supermarket. Discussion of current and future industry prototypes. Typically offered Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

Other Departmental /Program Course Requirements (69 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

FS 24500 - Food Packaging

Credit Hours: 1.00. Elements of packaging science and technology applied to preservation, distribution, and marketing of food products; packaging materials; principles of diffusion and permeability; procedures for developing, evaluating, and testing food packages; packaging requirements for specific types of foods; other special topics of current interest. Typically offered Spring.

FS 34000 - Introduction To Food Law And Regulations

Credit Hours: 1.00. This course will cover basic knowledge and familiarity of the principal law and regulations governing raw and processed foods. Class meets during weeks 1-5. . Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of

the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

NUTR 30300 - Essentials Of Nutrition

Credit Hours: 3.00. Basic nutrition and its application in meeting nutritional needs of all ages. Typically offered Fall Spring Summer. CTL:IHP 1402 Human Nutrition

NUTR 31500 - Fundamentals Of Nutrition

Credit Hours: 3.00. Basic principles of nutrition and their application in meeting nutritional needs during the life cycle. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Mathematics or Science Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and

research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (18 credits)

- Elective - Credit Hours: 18.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

FS 24500 - Food Packaging

Credit Hours: 1.00. Elements of packaging science and technology applied to preservation, distribution, and marketing of food products; packaging materials; principles of diffusion and permeability; procedures for developing, evaluating, and testing food packages; packaging requirements for specific types of foods; other special topics of current interest. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of

the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term

capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

NUTR 30300 - Essentials Of Nutrition

Credit Hours: 3.00. Basic nutrition and its application in meeting nutritional needs of all ages. Typically offered Fall Spring Summer. CTL:IHP 1402 Human Nutrition

NUTR 31500 - Fundamentals Of Nutrition

Credit Hours: 3.00. Basic principles of nutrition and their application in meeting nutritional needs during the life cycle. Typically offered Fall Spring.

AGEC 33300 - Food Distribution - A Retailing Perspective

Credit Hours: 3.00. Distribution factors that affect the food industry. Particular attention to the food wholesaling and retailing sectors. Presentation of economic tools to evaluate performance in the food industry. Discussion of the relative importance of each of the major departments in the modern supermarket. Discussion of current and future industry prototypes. Typically offered Spring.

FS 34000 - Introduction To Food Law And Regulations

Credit Hours: 1.00. This course will cover basic knowledge and familiarity of the principal law and regulations governing raw and processed foods. Class meets during weeks 1-5. . Typically offered Spring.

- Math/Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 6.00

16 Credits

Fall 4th Year

- AGEC 42700 - Advanced Agribusiness Marketing

- Economics Selective - Credit Hours: 3.00
- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits

Spring 4th Year

- Humanities or Social Selective (30000+ level) - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 6.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Economics: Applied Agricultural Economics Concentration, BS

About the Program

Agricultural economics graduates apply economic principles and use quantitative tools to analyze data which assists the agricultural sector in making better decisions. These decision involve a wide array of issues including price analysis, international development, international trade, environmental resources, and agricultural policy. Concentrations include:

- Applied Agricultural Economics
- Commodity Marketing
- Quantitative Analysis

Agricultural Economics (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Economics: Applied Agricultural Economics include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (96 credits)

Required Major Courses (32 credits)

Required AGEC courses (14 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the

growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

Major Selectives* - Select 6 of the following courses (18 credits)

- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00
- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (64 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and

interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Mathematics or Science Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (24 credits)

- Elective - Credit Hours: 24.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of

definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and

trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Agricultural Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

- Agricultural Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

- Math/Science Selection - Credit Hours: 3.00
- Agricultural Economics Selectives - Credit Hours: 6.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

- Agricultural Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

15 Credits

Spring 4th Year

- Agricultural Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Economics: Commodity Marketing Concentration, BS

About the Program

Agricultural economics graduates apply economic principles and use quantitative tools to analyze data which assists the agricultural sector in making better decisions. These decision involve a wide array of issues including price analysis, international development, international trade, environmental resources, and agricultural policy. Concentrations include:

- Applied Agricultural Economics
- Commodity Marketing
- Quantitative Analysis

Agricultural Economics (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Economics: Commodity Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (96 credits)

Required AGEC courses (27 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 30500 - Agricultural Prices

Credit Hours: 3.00. Analysis of prices and the movement of farm product prices; relations of farm product prices to farm input and other prices; conceptual and statistical analysis of agricultural supply and demand relationships; application of price analysis, price forecasting, agricultural outlook, agricultural policy; adjustment of farming to new price conditions. Typically offered Fall.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

AGEC 41100 - Farm Management

Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

Major Selectives* - Select 1 of the following courses (3 credits)

- AGEC Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (66 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include

the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Agry or Animal Science Selective at 20000+ - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic

probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Mathematics or Science Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (24 credits)

- Elective - Credit Hours: 24.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of

definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and

trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Agricultural Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

- Math/Science Selection - Credit Hours: 3.00

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

- Agry or Animal Science Selective at 20000+ - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Fall 4th Year

AGEC 30500 - Agricultural Prices

Credit Hours: 3.00. Analysis of prices and the movement of farm product prices; relations of farm product prices to farm input and other prices; conceptual and statistical analysis of agricultural supply and demand relationships; application of price analysis, price forecasting, agricultural outlook, agricultural policy; adjustment of farming to new price conditions. Typically offered Fall.

AGEC 41100 - Farm Management

Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

- Food and Agribusiness Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

- Economics Selective - Credit Hours: 3.00
- Electives - Credit Hours: 9.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Economics: Quanitative Analysis Concentration, BS

About the Program

Agricultural economics graduates apply economic principles and use quantitative tools to analyze data which assists the agricultural sector in making better decisions. These decision involve a wide array of issues including price analysis, international development, international trade, environmental resources, and agricultural policy. Concentrations include:

- Applied Agricultural Economics
- Commodity Marketing
- Quantitative Analysis

Agricultural Economics (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Economics: Quantitative Analysis include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (96 credits)

Required Major Courses (26 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 37500 - The Process Of Economic Research

Credit Hours: 1.00. This course is a study of the process of conducting economic research. The course examines the research problem and objectives, literature review, conceptual framework, methods and procedures, and reporting research. Students will identify a research topic and project advisor. For Honors program students only in Agricultural Economics. Permission of instructor required. Typically offered Fall.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 49900 - Thesis

Credit Hours: 1.00 to 6.00. Thesis. Permission of instructor required. Typically offered Fall Spring Summer.

AGEC 51600 - Mathematical Tools For Agricultural And Applied Economics

Credit Hours: 3.00. This course provides first year graduate students and advanced undergraduate students with the specific set of applied mathematical tools needed to support graduate coursework in microeconomics, macroeconomics, economic programming, and econometrics. The course reviews skills and concepts from a number of fields of mathematics including matrix algebra, calculus, optimization theory, and mathematical statistics. The course emphasizes specific applications to economic theory and applied problems in agricultural economics and related areas. Students should be comfortable with introductory-level calculus before entering the course. Permission of instructor required. Typically offered Fall.

Other Departmental /Program Course Requirements (70 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of

the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

ECON 34000 - Intermediate Microeconomic Theory

Credit Hours: 3.00. Topics from consumer behavior and demand, decisions under uncertainty, production and cost, factor demand, market structure, general equilibrium and welfare. Emphasis on the tools used to analyze the behavior of individual economic units. Typically offered Fall Spring.

- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (24 credits)

- Elective - Credit Hours: 24.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure

monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- UCC Science, Technology, & Society Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 37500 - The Process Of Economic Research

Credit Hours: 1.00. This course is a study of the process of conducting economic research. The course examines the research problem and objectives, literature review, conceptual framework, methods and procedures, and reporting research. Students will identify a research topic and project advisor. For Honors program students only in Agricultural Economics. Permission of instructor required. Typically offered Fall.

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 6.00

16 Credits

Spring 3rd Year

AGEC 49900 - Thesis

Credit Hours: 1.00 to 6.00. Thesis. Permission of instructor required. Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Fall 4th Year

AGEC 49900 - Thesis

Credit Hours: 1.00 to 6.00. Thesis. Permission of instructor required. Typically offered Fall Spring Summer.

AGEC 51600 - Mathematical Tools For Agricultural And Applied Economics

Credit Hours: 3.00. This course provides first year graduate students and advanced undergraduate students with the specific set of applied mathematical tools needed to support graduate coursework in microeconomics, macroeconomics, economic programming, and econometrics. The course reviews skills and concepts from a number of fields of mathematics including matrix algebra, calculus, optimization theory, and mathematical statistics. The course emphasizes specific applications to economic theory and applied problems in agricultural economics and related areas. Students should be comfortable with introductory-level calculus before entering the course. Permission of instructor required. Typically offered Fall.

ECON 34000 - Intermediate Microeconomic Theory

Credit Hours: 3.00. Topics from consumer behavior and demand, decisions under uncertainty, production and cost, factor demand, market structure, general equilibrium and welfare. Emphasis on the tools used to analyze the behavior of individual economic units. Typically offered Fall Spring.

- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

14 Credits

Spring 4th Year

AGEC 49900 - Thesis

Credit Hours: 1.00 to 6.00. Thesis. Permission of instructor required. Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Electives - Credit Hours: 9.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Farm Management, BS

About the Program

Farm Management prepares people for managing the home farm, professional farm management, or understanding the challenge of managing a farm. Emphasis is placed on production, finance, marketing, and management strategies.

Farm Management Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Farm Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (104 credits)

Required Major Courses (28 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 41100 - Farm Management

Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in

inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

Other Departmental /Program Course Requirements (76 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Mathematics or Science Selective - Credit Hours: 3.00

AGEC 31100 - Accounting For Farm Business Planning

Credit Hours: 3.00. This course emphasizes the development of procedures for providing and using data in decision making. Methods will be addressed for finding and organizing both financial and physical data to provide the business information needed in planning and control. Topics discussed include budgeting, reporting unit costs of production, measuring profitability and wealth accumulation, estimating credit needs and income tax liability, and evaluating the strengths and weaknesses of the business as the basis for improving the business. Typically offered Fall.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Farm Management Business Selective - Credit Hours: 3.00
- Farm Management Business Selective - Credit Hours: 3.00
- Farm Management Business Selective - Credit Hours: 3.00
- Production Agriculture Selective - Credit Hours: 3.00
- Production Agriculture Selective - Credit Hours: 3.00

- Production Agriculture Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (16 credits)

- Elective - Credit Hours: 16.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication

- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

15 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Production Agriculture Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

17 Credits

Spring 2nd Year

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

- Biological Science Selective - Credit Hours: 4.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

AGEC 31100 - Accounting For Farm Business Planning

Credit Hours: 3.00. This course emphasizes the development of procedures for providing and using data in decision making. Methods will be addressed for finding and organizing both financial and physical data to provide the business information needed in planning and control. Topics discussed include budgeting, reporting unit costs of production, measuring profitability and

wealth accumulation, estimating credit needs and income tax liability, and evaluating the strengths and weaknesses of the business as the basis for improving the business. Typically offered Fall.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00
- Farm Management Business Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

- Economics Selective - Credit Hours: 3.00
- Farm Management Business Selective - Credit Hours: 3.00
- Math/Science Selective - Credit Hours: 3.00
- Production Agriculture Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 41100 - Farm Management

Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Production Agriculture Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00

14 Credits

Spring 4th Year

- Farm Management Business Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 7.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Sales and Marketing, BS

About the Program

Sales and marketing graduate complete a degree program with a focus in sales, marketing, and management that give them the ability to enter numerous entry-level sales positions for agricultural and non-agricultural firms. These positions lead to professional careers in sales or marketing management. A wide spectrum of agricultural marketing organizations, food manufacturing companies, and farm supply industries are marketing-oriented and depend extensively on agricultural graduates who are well-trained in marketing tools and concepts.

Sales and Marketing Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Sales & Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (101 credits)

Required Major Courses (37 credits)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

AGEC 43100 - Advanced Agri-Sales And Marketing

Credit Hours: 4.00. Advanced techniques of salesmanship, field application of selling techniques, improving communication skills, study of agribusiness marketing strategies, interaction with industry agri-marketers, and strategies for career development in agri-marketing. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Permission of instructor required. Typically offered Fall.

Other Departmental /Program Course Requirements (64 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic

probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Communication Marketing Selective - Credit Hours: 3.00
- Mathematics or Science Selective - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00
- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (19 credits)

- Elective - Credit Hours: 19.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy

- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include

the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11200 - Introduction To Agricultural Economics Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural Economics. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Biological Sciences Selective - Credit Hours: 4.00

16 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Biological Sciences Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 29800 - Sophomore Seminar

Credit Hours: 1.00. Current agricultural economics issues will be analyzed and discussed. Issue areas will be related to individual career planning and program development. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Communication Marketing Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the

statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in

inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

- Economics selective - Credit Hours: 3.00
- Math/Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

AGEC 43100 - Advanced Agri-Sales And Marketing

Credit Hours: 4.00. Advanced techniques of salesmanship, field application of selling techniques, improving communication skills, study of agribusiness marketing strategies, interaction with industry agri-marketers, and strategies for career development in agri-marketing. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Permission of instructor required. Typically offered Fall.

- Electives - Credit Hours: 6.00

13 Credits

Spring 4th Year

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

- Humanities or Social Science Selective (30000+level) - Credit Hours: 3.00
- Electives - Credit Hours: 7.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Farm Management Minor

18 credits

Required Courses

(10 credits)

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 31100 - Accounting For Farm Business Planning

Credit Hours: 3.00. This course emphasizes the development of procedures for providing and using data in decision making. Methods will be addressed for finding and organizing both financial and physical data to provide the business information needed in planning and control. Topics discussed include budgeting, reporting unit costs of production, measuring profitability and wealth accumulation, estimating credit needs and income tax liability, and evaluating the strengths and weaknesses of the business as the basis for improving the business. Typically offered Fall.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

AGEC 41100 - Farm Management

Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall.

Selectives

(8 credits from the following)

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42500 - Estate Planning And Property Transfer

Credit Hours: 3.00. The ownership and transfer of farm business property. Includes tax and other implications of life estates, trust arrangements, sale of property, and charitable contributions. Typically offered Fall.

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

AGEC 45600 - Federal Income Tax Law

Credit Hours: 3.00. Introduction to the federal income tax laws applicable to individuals and small business with emphasis on the farming business. The course includes management implications and the policy basis for the tax law system. Techniques and practice for the preparation of selected forms will be included. There will be limited exposure to taxation of partnerships, corporations, estates, and to federal gift and estate tax law. Typically offered Spring.

AGEC 52400 - Agricultural Finance

Credit Hours: 3.00. Designed to provide students the concepts and tools to apply financial management principles to farm businesses. Topics include financing alternatives, preparation and interpretation of financial statements, and capital investment analysis using discounted cash flows. Typically offered Spring.

OLS 25200 - Human Relations In Organizations

Credit Hours: 3.00. A survey of the concepts that provide a foundation for the understanding of individual and group behavior in organizations. Special emphasis on typical interpersonal and leadership relationships. Typically offered Fall Spring Summer.

OLS 27400 - Applied Leadership

Credit Hours: 3.00. Introduction to applied leadership in the context of organizational functions, structures, and operation. Typically offered Fall Spring Summer.

Notes

Department permission is not required to enroll in this minor.

* The required 18 credits are beyond the three-credit economics selective that is a part of core requirements for students in the College of Agriculture. For students from programs outside of the College of Agriculture, three credits of an economics selective are required in addition to the 18 credits noted above.

Food and Agribusiness Management Minor

18 credits

Required Courses

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 20400 - Introduction To Resource Economics And Environmental Policy

Credit Hours: 3.00. The course provides an overview of microeconomic theory and its application to issues related to evaluating resource economic issues and environmental policy. Topics discussed include efficiency, sustainability, valuation, externalities, governmental policies, and benefit cost analysis. Typically offered Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 31100 - Accounting For Farm Business Planning

Credit Hours: 3.00. This course emphasizes the development of procedures for providing and using data in decision making. Methods will be addressed for finding and organizing both financial and physical data to provide the business information needed in planning and control. Topics discussed include budgeting, reporting unit costs of production, measuring profitability and wealth accumulation, estimating credit needs and income tax liability, and evaluating the strengths and weaknesses of the business as the basis for improving the business. Typically offered Fall.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

Selectives

(9 credits from the following*)

AGEC 22000 - Economics Of Agricultural Markets

Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring.

AGEC 32100 - Principles Of Commodity Marketing

Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGEC 33300 - Food Distribution - A Retailing Perspective

Credit Hours: 3.00. Distribution factors that affect the food industry. Particular attention to the food wholesaling and retailing sectors. Presentation of economic tools to evaluate performance in the food industry. Discussion of the relative importance of each of the major departments in the modern supermarket. Discussion of current and future industry prototypes. Typically offered Spring.

AGEC 35200 - Quantitative Techniques For Firm Decision Making

Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring.

AGEC 42100 - Advanced Commodity Marketing

Credit Hours: 3.00. Application of commodity marketing principles to grain, livestock, and other commodity sectors. Applications include hedging, speculation, risk management, and fundamental and technical price analysis. Examination and testing of pricing strategies and the development of commodity marketing plans. Typically offered Spring.

AGEC 42400 - Financial Management Of Agricultural Business

Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring.

AGEC 42500 - Estate Planning And Property Transfer

Credit Hours: 3.00. The ownership and transfer of farm business property. Includes tax and other implications of life estates, trust arrangements, sale of property, and charitable contributions. Typically offered Fall.

AGEC 42700 - Advanced Agribusiness Marketing

Credit Hours: 3.00. Application of marketing principles to market planning, research, and analysis. Development of strategic marketing plans for agribusiness. Typically offered Fall.

AGEC 42900 - Agribusiness Marketing Workshop

Credit Hours: 2.00. Research, development, and presentation of a strategic agribusiness marketing plan. Permission of instructor required. Typically offered Spring.

AGEC 43000 - Agricultural And Food Business Strategy

Credit Hours: 3.00. An advanced course in business planning and strategy for potential agribusiness and food firm managers. Focuses on development of viable business strategy in the context of the firm's market and its internal condition. Makes extensive use of case studies that document management dilemmas of agribusiness firms, ranging from those providing inputs to agricultural producers to firms involved in the retail distribution of food. Typically offered Fall Spring.

AGEC 43100 - Advanced Agri-Sales And Marketing

Credit Hours: 4.00. Advanced techniques of salesmanship, field application of selling techniques, improving communication skills, study of agribusiness marketing strategies, interaction with industry agri-marketers, and strategies for career development in agri-marketing. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Permission of instructor required. Typically offered Fall.

AGEC 45100 - Applied Econometrics

Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring.

AGEC 45500 - Agricultural Law

Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall.

MGMT 45500 - Legal Background For Business I

Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer.

AGEC 45600 - Federal Income Tax Law

Credit Hours: 3.00. Introduction to the federal income tax laws applicable to individuals and small business with emphasis on the farming business. The course includes management implications and the policy basis for the tax law system. Techniques and practice for the preparation of selected forms will be included. There will be limited exposure to taxation of partnerships, corporations, estates, and to federal gift and estate tax law. Typically offered Spring.

AGEC 49600 - Selected Topics In Agribusiness Management

Credit Hours: 1.00. Intended for individuals in the food industry marketing and management, sales and marketing, agribusiness management, agricultural finance, and farm management options. Also open to students in other agricultural economics options as well as to students outside the department. Focuses on current topics in the management of food and agribusiness firms. Provides advanced treatment of these topics for upper-division students. This is a set of one-hour seminars that will address current topics in food and agribusiness management. The topics of focus will be those that either are not treated in other courses, or are not treated in depth needed by a student pursuing a management career in the food and agribusiness industries. Topics will be reviewed annually as to relevance and will be changed as needed. Five week session. Typically offered Fall Spring.

AGEC 50600 - Agricultural Marketing And Price Analysis

Credit Hours: 3.00. Marketing margins and derived demand; elasticity. Modeling supply and demand relationships; single and multiple equation systems; forecasting. Industrial organization economics applied to the food processing, wholesaling, and retailing industries; subsector analysis, vertical coordination; marketing and competition policies. Typically offered Spring.

AGEC 52400 - Agricultural Finance

Credit Hours: 3.00. Designed to provide students the concepts and tools to apply financial management principles to farm businesses. Topics include financing alternatives, preparation and interpretation of financial statements, and capital investment analysis using discounted cash flows. Typically offered Spring.

AGEC 52500 - Environmental Policy Analysis

Credit Hours: 3.00. Designed to assist in understanding how environmental information and knowledge are produced, disseminated, and utilized in a variety of institutional contexts. Readings are selected to promote discussion and interaction concerning alternative mechanisms for protecting environmental resources. Prerequisite: introductory microeconomics course suggested. Typically offered Spring.

AGEC 52600 - International Food And Agribusiness Marketing Strategy

Credit Hours: 3.00. Students will develop their analytical, decision-making, and communication skills related to marketing management of food systems in the world economy. They will analyze a foreign market's potential and market entry strategies; compare consumer differences and similarities across markets; define issues related to marketing mix standardization or adaptation; and evaluate effects of economic, social, and legal environments on marketing strategy. Typically offered Fall.

AGEC 53000 - Strategic Agribusiness Management

Credit Hours: 3.00. Addresses issues in the strategic management of agricultural and food businesses. Emphasis is on developing

a framework for formulating strategy, making strategic choices in a variety of business environments, and implementing strategy. Extensive use of management case studies and a major term project with an agribusiness firm focus on developing managerial problem-solving skills. Typically offered Fall.

AGEC 53300 - Supply Chain Management For Food And Agribusiness

Credit Hours: 3.00. Students will develop an understanding of how the theory of logistics is applied as supply chain management for food and agribusiness firms. Through case studies and problem sets, students will analyze and consider contemporary issues and problems. Analyses will focus on tradeoffs among customer service, forecasting, inventory control, information technology, transportation management, warehousing and materials handling, and supply chain planning. Typically offered Spring.

CSR 20900 - Introduction To Retail Management

Credit Hours: 3.00. Retail career paths, management training, merchandise control, organization and service structure, and a comparison of store types. Typically offered Fall Spring.

CSR 28200 - Customer Relations Management

Credit Hours: 3.00. A course that provides insight into the structure and working of customer relations management and its role in business and government agency. Analysis of how consumer needs, complaints, and education are handled. Customer relations' management in the real world and techniques used in managing customer relations toward the goal of maximizing customer satisfaction. This course has a real world focus and is more applied than the usual introductory course. Typically offered Fall Spring.

CSR 30900 - Leadership Strategies

Credit Hours: 3.00. Provides knowledge of humanistic processes that contribute to development of effective leadership. Typically offered Spring.

CSR 31500 - Relationship Selling

Credit Hours: 3.00. This course focuses on long term relationship selling. The course is organized around a seven step selling process which has proven to be effective. The course adds to this process some principles of marketing and business strategy. The elements are necessary for the success of professional salesperson both in successful prospecting and making strategic choices as to how to allocate their time within the territory. Important to the learning process is actually practice of principles. Students will do various exercises of principles such as prospecting and negotiation. At the end of the semester, students will hone the skills learned through the semester with a series of roll plays designed to put them in position of both seller and buyer. Typically offered Fall Spring Summer.

CSR 33100 - Consumer Behavior

Credit Hours: 3.00. An interdisciplinary survey of consumer behavior theory focused on psychological, sociological, and cultural influences on consumer choice and use of products and services. Credit will not be given for both CSR 33100 and PSY 28500. Typically offered Fall Spring.

CSR 33200 - Cross-Cultural Marketing And International Retailing

Credit Hours: 3.00. Examination of marketing/retail practices used to target domestic and global consumer market segments. Development of successful retail and marketing strategies is stressed. Typically offered Fall Spring.

CSR 34200 - Personal Finance

Credit Hours: 3.00. The class covers a comprehensive discussion of investments, consumer credit, insurance and retirement issues. The goal is to show how these components are interconnected in order to create a complete picture of financial health of an individual. Typically offered Spring Summer Fall. CTL:IPO 1811 Personal Finance

CSR 38600 - Risk Management

Credit Hours: 3.00. The course includes principles of insurance, analysis and evaluation of risk exposures, legal aspects of insurance, insurance needs and analysis, policy selection, and insurance company selection and due diligence. Types of insurance that are studied include: property and casualty, health, life, long-term care, disability and general business liability. Typically offered Fall.

CSR 40100 - Buying Of Merchandise

Credit Hours: 3.00. Principles of volume buying applicable to department, chain, specialty, and independent stores. Typically offered Fall Spring.

CSR 40400 - Strategic Issues For Sales And Retailing

Credit Hours: 3.00. Analysis of selected retail organizations and their channel partners through in-depth discussion of contemporary paradigms in strategic marketing for both sales and retailing perspectives and their applications to management. Typically offered Fall Spring Summer.

CSR 40600 - E-Retailing

Credit Hours: 3.00. To provide understanding of the technological and retail infrastructure that underlines doing retailing over the internet. Build an understanding of business strategies over the net. To identify management issues and consumer issues in e-retailing. Typically offered Fall.

CSR 41500 - Sales Force Management

Credit Hours: 3.00. An introduction to sales force management. An examination of the sales force management process, including principles of recruiting and selecting, training, compensation, motivation, supervision, and evaluation. Planning skills, including sales force deployment and the role of the sales force in sales forecasting, are also covered. Typically offered Fall Spring.

CSR 48100 - Ethics And Compliance In Financial Counseling And Planning

Credit Hours: 2.00. Examination of the ethical and compliance issues in the basic areas of investments, risk management, taxation, retirement and estate planning. Typically offered Fall Spring.

CSR 48400 - Consumer Investment And Savings Decisions

Credit Hours: 3.00. A survey of consumer investment alternatives, with emphasis on financial assets. Typically offered Fall Spring.

CSR 48500 - Case Studies In Financial Planning

Credit Hours: 3.00. Financial planning principles and practice. Course utilizes a case study approach toward financial planning for upper- and middle-income households. Business calculator required. Typically offered Fall Spring.

CSR 48600 - Retirement Planning And Employee Benefits

Credit Hours: 3.00. Analysis of employee benefit plans, retirement needs analysis, and types of retirement plans including employer sponsored plans and participant directed plans. Typically offered Fall Spring.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

Notes

Department permission is not required to enroll in this minor.

Any Management (MGMT) or Organizational Leadership and Supervision (OLS) course at the 20000 level or above may be used. Only one course from OLS 25200 and OLS 27400 may be used.

* At least six of the nine selective credits must be in Agricultural Economics (AGEC) courses.

Department of Agronomy

Overview

The Department of Agronomy provides progressive and relevant undergraduate, graduate and extension education programs; conducts high impact fundamental and applied research at multiple scales to ensure that our science addresses immediate problems and anticipates future challenges; actively engages partners in the public and private sectors; and contributes to the development of the national and international agenda for research and education.

Faculty

https://ag.purdue.edu/agry/directory/Pages/default.aspx

Contact Information

Department of Agronomy

Purdue University

Lilly Hall of Life Sciences
915 W. State Street
West Lafayette, IN 47907-2054
Phone: 765-494-4773

Email: agronomy@purdue.edu

Website: http://ag.purdue.edu/agry

The main office for the department is located in Room 2-414 of LILY Hall

Graduate Information

For Graduate Information please see Agronomy Graduate Program Information.

Agronomy: Agronomic Business and Marketing Concentration, BS

About the Program

Agronomy includes three areas of concentration:

Agronomic Business and Marketing prepares students to meet the high demand for professionals in technical sales and marketing or professional field agronomy with strength in business. Students have the flexibility to tailor plans of study to meet their individualized interests and needs by combining strengths in business, marketing, and agronomy. The unique advantage of this option is the primary strength generated in cropping system management amplified by strength in agri-business management.

Crop and Soil Management is for students interested in applying basic agronomic information to practical situations or problems. This is an ideal option for students who plan to become a professional crops/soils manager as an agronomist, farm manager, soil conservationist, or a related profession. Those interested in crop management frequently select cropping systems, crop physiology, plant breeding, and forage management courses.

International Agronomy is designed for students interested in the agronomic aspects of international agricultural development. The program prepares students for opportunities in world agriculture through careers with social action agencies, government and/or private industry. Students in this major build a strong foundation in science to go along with their study of international trade, culture, religion, language, food security, and agricultural development.

Agronomy (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agronomy: Agronomic Business Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114 credits)

Required Major Courses (11 credits)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

Other Departmental /Program Course Requirements (103 credits)

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

MGMT 32300 - Principles Of Marketing

Credit Hours: 3.00. This mixed lecture and case course provides an overview of the functional area of marketing. The course is taught from a managerial perspective; it focuses on inputs to the marketing decision-making process, the process itself, and its results. No credit for students in the School of Management, except economics majors. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic

importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENGL 42000 - Business Writing

Credit Hours: 3.00. Workplace writing in networked environments for management contexts. Emphasizes organizational context, project planning, document management, ethics, research, team writing. Typical genres include management memos, reports, letters, e-mail, resumes (print and online), oral presentations. Typically offered Summer Fall Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Agronomy Crops Selective - Credit Hours: 3.00
- Agronomy Selective (Science, Technology, & Society) - Credit Hours: 3.00
- Agronomy Selective - Credit Hours: 3.00

- Ecology Selective - Credit Hours: 3.00
- Agricultural Economics Selective - Credit Hour: 6.00
- Agricultural Economics or Management Selective - Credit Hours: 3.00
- Agricultural Economics, Consumer Science and Retailing, Horticulture, or OLS Selective - Credit Hours: 6.00
- Additional Math or Science Selective - Credit Hours: 8.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (6 credits)

- Elective - Credit Hours: 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication

- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Agronomy Crops Selective - Credit Hours: 3.00

14 Credits

Spring 1st Year

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure

and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

- Agronomy Selective - Credit Hours: 3.00

17 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply,

temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

14 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agricultural Economics Selective - Credit Hours: 3.00
- Agronomy Selective (Science, Technology, and Society) - Credit Hours: 3.00
- Ecology Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

- Additional Math or Science Selectives - Credit Hours: 4.00
- Agricultural Economics or Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

- Additional Math or Science Selectives - Credit Hours: 4.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

- Agricultural Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

13 Credits

Spring 4th Year

AGEC 32700 - Principles Of Food And Agribusiness Marketing

Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring.

MGMT 32300 - Principles Of Marketing

Credit Hours: 3.00. This mixed lecture and case course provides an overview of the functional area of marketing. The course is taught from a managerial perspective; it focuses on inputs to the marketing decision-making process, the process itself, and its results. No credit for students in the School of Management, except economics majors. Typically offered Fall Spring.

ENGL 42000 - Business Writing

Credit Hours: 3.00. Workplace writing in networked environments for management contexts. Emphasizes organizational context, project planning, document management, ethics, research, team writing. Typical genres include management memos, reports, letters, e-mail, resumes (print and online), oral presentations. Typically offered Summer Fall Spring.

- Agricultural Economics, Consumer Science and Retailing, Horticulture, or OLS Selective - Credit Hours: 6.00
- Electives - Credit Hours: 3.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agronomy: Crop and Soil Management Concentration, BS

About the Program

Agronomy includes three areas of concentration:

Agronomic Business and Marketing prepares students to meet the high demand for professionals in technical sales and marketing or professional field agronomy with strength in business. Students have the flexibility to tailor plans of study to meet their individualized interests and needs by combining strengths in business, marketing, and agronomy. The unique advantage of this option is the primary strength generated in cropping system management amplified by strength in agri-business management.

Crop and Soil Management is for students interested in applying basic agronomic information to practical situations or problems. This is an ideal option for students who plan to become a professional crops/soils manager as an agronomist, farm manager, soil conservationist, or a related profession. Those interested in crop management frequently select cropping systems, crop physiology, plant breeding, and forage management courses.

International Agronomy is designed for students interested in the agronomic aspects of international agricultural development. The program prepares students for opportunities in world agriculture through careers with social action agencies, government and/or private industry. Students in this major build a strong foundation in science to go along with their study of international trade, culture, religion, language, food security, and agricultural development.

Agronomy (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agronomy: Crop & Soil Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (14 credits)

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

Other Departmental /Program Course Requirements (94 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure,

spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agronomy Selective (Science, Technology, & Society) - Credit Hours: 3.00
- Agronomy Selective - Credit Hours: 3.00
- Ecology or Plant Ecology Selective - Credit Hours: 3.00

- Directed Selective - Credit Hours: 27.00
- Math or Science Selectives - Credit Hours: 8.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning

- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological

advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

- Economics Selective - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

17 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Directed Selective - Credit Hours: 3.00

14 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic

probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agronomy Selective (Science, Technology, and Society) - Credit Hours: 3.00
- Ecology or Plant Ecology Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- Directed Selectives - Credit Hours: 6.00
- Math or Science Selectives - Credit Hours: 4.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

- Agronomy Selective - Credit Hours: 3.00
- Directed Selective - Credit Hours: 3.00
- Math or Science Selectives - Credit Hours: 4.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

16 Credits

Fall 4th Year

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions,

professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

- Directed Selectives - Credit Hours: 6.00
- UCC Humanities Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

- Directed Selectives - Credit Hours: 9.00
- Electives - Credit Hours: 3.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agronomy: International Agronomy Concentration, BS

About the Program

Agronomy includes three areas of concentration:

Agronomic Business and Marketing prepares students to meet the high demand for professionals in technical sales and marketing or professional field agronomy with strength in business. Students have the flexibility to tailor plans of study to meet their individualized interests and needs by combining strengths in business, marketing, and agronomy. The unique advantage of this option is the primary strength generated in cropping system management amplified by strength in agri-business management.

Crop and Soil Management is for students interested in applying basic agronomic information to practical situations or problems. This is an ideal option for students who plan to become a professional crops/soils manager as an agronomist, farm manager, soil conservationist, or a related profession. Those interested in crop management frequently select cropping systems, crop physiology, plant breeding, and forage management courses.

International Agronomy is designed for students interested in the agronomic aspects of international agricultural development. The program prepares students for opportunities in world agriculture through careers with social action agencies, government and/or private industry. Students in this major build a strong foundation in science to go along with their study of international trade, culture, religion, language, food security, and agricultural development.

Agronomy (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agronomy: International Agronomy include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (111 credits)

Required Major Courses (21 credits)

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 35000 - Global Awareness

Credit Hours: 1.00 to 3.00. A seminar-type course about world geography, cultures, and agriculture. Speakers are selected from the many Purdue graduate students and visiting scholars from around the world. Extra credit may be earned through independent study of a global issue. Typically offered Spring.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 59800 - Special Problems

Credit Hours: 1.00 to 6.00. Research on agronomic problems conducted in laboratory, field, or library; report required; arrange with an agronomy staff member before registering. Permission of instructor required. Typically offered Fall Spring Summer.

Other Departmental /Program Course Requirements (90 credits)

AGEC 34000 - International Economic Development

Credit Hours: 3.00. This course is designed to introduce students to issues and problems related to international economic development. Topics covered include a description of the current situation in developing countries and the history of growth and development. The course is grounded in the body of theory associated with economic development, but concentrates on the many practical problems such as poverty, population growth, urbanization, education and the environment. The three areas with the greatest attention are agricultural development, international trade, and policy analysis for developing countries. Typically offered Spring.

AGEC 45000 - International Agricultural Trade

Credit Hours: 3.00. Study of U.S. agricultural trade with emphasis on international trade theory, exchange rates and their determination, relationships between domestic agricultural policies and trade policies, and analysis of institutional arrangements for world trade in agricultural products. Typically offered Fall.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in

agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology or Plant Ecology Selective - Credit Hours: 3.00
- AGR International Development Selective - Credit Hours: 3.00
- Macroeconomics Selective - Credit Hours: 3.00
- Conversation Language Selective - Credit Hours: 2.00
- Directed Selective - Credit Hours: 6.00
- AGR or SCI Selective - Credit Hours: 6.00
- Additional Math or Science Selective - Credit Hours: 8.00
- Microeconomics (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Foreign Language Selective - Credit Hours: 9.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from

interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (9 credits)

- Elective - Credit Hours: 9.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

- Microeconomics Selective - Credit Hours: 3.00

17 Credits

Fall 2nd Year

- Macroeconomics Selective - Credit Hours: 3.00

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

- Foreign Language Selective - Credit Hours: 3.00

14 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology or Plant Ecology Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 45000 - International Agricultural Trade

Credit Hours: 3.00. Study of U.S. agricultural trade with emphasis on international trade theory, exchange rates and their determination, relationships between domestic agricultural policies and trade policies, and analysis of institutional arrangements for world trade in agricultural products. Typically offered Fall.

- Directed Selective - Credit Hours: 3.00
- Foreign Language Selective - Credit Hours: 3.00
- Math or Science Selectives - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGEC 34000 - International Economic Development

Credit Hours: 3.00. This course is designed to introduce students to issues and problems related to international economic development. Topics covered include a description of the current situation in developing countries and the history of growth and development. The course is grounded in the body of theory associated with economic development, but concentrates on the many practical problems such as poverty, population growth, urbanization, education and the environment. The three areas with the greatest attention are agricultural development, international trade, and policy analysis for developing countries. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 35000 - Global Awareness

Credit Hours: 1.00 to 3.00. A seminar-type course about world geography, cultures, and agriculture. Speakers are selected from the many Purdue graduate students and visiting scholars from around the world. Extra credit may be earned through independent study of a global issue. Typically offered Spring.

- Conversation Language Selective - Credit Hours: 2.00
- Math or Science Selectives - Credit Hours: 4.00

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

16 Credits

Fall 4th Year

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 59800 - Special Problems

Credit Hours: 1.00 to 6.00. Research on agronomic problems conducted in laboratory, field, or library; report required; arrange with an agronomy staff member before registering. Permission of instructor required. Typically offered Fall Spring Summer.

- AGR International Development Selective - Credit Hours: 3.00
- Foreign Language Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Spring 4th Year

- Directed Selectives - Credit Hours: 3.00
- AGR or SCI Selective - Credit Hours: 6.00
- Electives - Credit Hours: 6.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Applied Meteorology and Climatology, BS

About the Program

Many graduates pursue careers with the National Weather Service, the National Environmental Satellite Data and Information Service, the Environmental Research Laboratories, and the Department of Defense. Graduates also pursue careers with private meteorological or environmental consulting firms that provide weather information and apply atmospheric sciences to air pollution control, energy distribution, marketing, transportation, weather modification, and agriculture. Graduates also work for insurance and commodities industries that employ meteorologists who are educated in statistics, agriculture, and world climates.

Applied meteorologists apply weather and climate information to problems facing agriculture and commerce. Students acquire the skills and tools necessary to improve the health, safety, and productivity of today's world. Graduates work on many environmental problems such as air quality, renewable energy sources, climate change and the impacts of climate change.

The option involves extensive coursework in meteorology, physics, and mathematics, as well as first-hand experience in applying basic concepts to real world situations. Internship programs are available with private industry, the National Weather Service, or the National Oceanic and Atmospheric Administration. In addition there are regular opportunities to work in University laboratories and the State Climate Office.

Applied Meteorology and Climatology Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Applied Meteorology and Climatology include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (113 credits)

Required Major Courses (32 credits)

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 43100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (EAPS 42100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

AGRY 43200 - Atmospheric Dynamics I

Credit Hours: 3.00. (EAPS 42200) A study of the general system of equations governing mass and momentum changes in the atmosphere; special horizontal wind representations; thermal wind relationships; circulation, vorticity, divergence, and vertical motion. Typically offered Spring.

AGRY 43300 - Atmospheric Dynamics II

Credit Hours: 3.00. (EAPS 42300) An extension of AGRY 43200 with the emphasis on perturbation theory and hydrodynamic stability, air mass and frontal theory, barotrophic and baroclinic models, wave cyclone theory, and numerical weather prediction. Typically offered Fall.

AGRY 44100 - Synoptic Laboratory I

Credit Hours: 1.00. (EAPS 43100) Analysis of vertical distributions of temperature and moisture with applications to adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

AGRY 44200 - Synoptic Laboratory II

Credit Hours: 1.00. (EAPS 43200) Analysis of horizontal distributions of pressure, temperature, wind, vorticity, and vertical motions. Applications to synopticscale wave propagation. Typically offered Spring.

AGRY 44300 - Synoptic Laboratory III

Credit Hours: 1.00. (EAPS 43300) Diagnosis of midtropospheric wave propagation and growth. Analysis of surface pressure fields and fronts and their relationships to upper air features. Extensive use is made of teletype and facsimile weather information. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 53500 - Boundary Layer Meteorology

Credit Hours: 3.00. (EASP 52500) This course has required class trips. Students will pay individual lodging or meal expenses where necessary. A study of the physical nature of the lowest layers of the atmosphere. The energy balance concept and the turbulent transfer of heat, momentum, and water vapor are discussed in detail. Some specific microclimates are studied in this context. Typically offered Spring.

AGRY 53600 - Environmental Biophysics

Credit Hours: 3.00. An analysis of the energy fluxes to and from terrestrial plants, insects, mammals, and humans as they exist in their macro and microclimates. Agricultural meteorology methods (both research and operational) will be presented. Labs will be both in-laboratory and in-field with reports required. A special project will be required of all students and will be presented in class and written as if for publication. Typically offered Spring.

AGRY 54500 - Remote Sensing Of Land Resources

Credit Hours: 3.00. Application of remote sensing and spatial databases for observing and managing land resources within the Earth System; analysis and interpretation of remotely sensed data in combination with field observations and other data sources; conceptualization and design of a global earth resources information system. Typically offered Fall.

Other Departmental /Program Course Requirements (81 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in

agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CS 15800 - C Programming

Credit Hours: 3.00. Introduction to structured programming in C. Data types and expression evaluation. Programmer-defined functions including passing parameters by value and by address. Selection topics include if/else/else-if, conditional expressions, and switch. Repetition topics include while, do-while, for, and recursion. External file input and output. Arrays, analysis of searching and sorting algorithms, and strings. Pointers and dynamic memory allocation. Students are expected to complete assignments in a collaborative environment. CS 15800 may be used to satisfy College of Science requirement of participation in at least one team-building and collaboration experience. Typically offered Summer Fall Spring.

EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences

Credit Hours: 1.00. Seminar presented by guests in different fields of the Earth and Atmospheric Sciences to expose students to the range of topics included in the department and in possible career paths. Typically offered Fall Spring.

EAPS 43400 - Weather Analysis And Forecasting

Credit Hours: 3.00. (AGRY 44400) In-depth study of contemporary weather analysis and forecasting techniques and problems. Extensive use is made of teletype and facsimile data and numerical weather prediction guidance provided by the National Meteorological Center. Typically offered Spring.

EAPS 53200 - Atmospheric Physics I

Credit Hours: 3.00. Cloud and precipitation physics and basic atmospheric radiative transfer. Introduction to computer aided problem solving. Typically offered Spring.

EAPS 53500 - Atmospheric Observations And Measurements

Credit Hours: 3.00. A course that introduces students to direct and remotely sensed observations of the atmosphere. Directly measured quantities discussed include temperature, pressure, moisture, wind, solar radiation, chemical properties of the atmosphere, etc. Remote sensing of cloud, precipitation, and air motion by weather radars, satellites, profilers, lidars, and other emerging technologies is reviewed. Students will gain experience in observation techniques and data interpretation, and will learn uncertainty and error assessment. Prior course work in atmospheric science and statistics is required. Typically offered Fall.

MA 16100 - Plane Analytic Geometry And Calculus I

Credit Hours: 5.00. Introduction to differential and integral calculus of one variable, with applications. Some schools or departments may allow only 4 credit hours toward graduation for this course. Designed for students who have not had at least a one-semester calculus course in high school, with a grade of "A" or "B". Not open to students with credit in MA 16500. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring Summer.

MA 16200 - Plane Analytic Geometry And Calculus II

Credit Hours: 5.00. Continuation of MA 16100. Vectors in two and three dimensions, techniques of integration, infinite series, conic sections, polar coordinates, surfaces in three dimensions. Some schools or departments may allow only 4 credit hours toward graduation for this course. Typically offered Fall Spring Summer.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (7 credits)

- Elective - Credit Hours: 7.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

MA 16100 - Plane Analytic Geometry And Calculus I

Credit Hours: 5.00. Introduction to differential and integral calculus of one variable, with applications. Some schools or

departments may allow only 4 credit hours toward graduation for this course. Designed for students who have not had at least a one-semester calculus course in high school, with a grade of "A" or "B". Not open to students with credit in MA 16500. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring Summer.

13 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences

Credit Hours: 1.00. Seminar presented by guests in different fields of the Earth and Atmospheric Sciences to expose students to the range of topics included in the department and in possible career paths. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16200 - Plane Analytic Geometry And Calculus II

Credit Hours: 5.00. Continuation of MA 16100. Vectors in two and three dimensions, techniques of integration, infinite series, conic sections, polar coordinates, surfaces in three dimensions. Some schools or departments may allow only 4 credit hours toward graduation for this course. Typically offered Fall Spring Summer.

17 Credits

Fall 2nd Year

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

CS 15800 - C Programming

Credit Hours: 3.00. Introduction to structured programming in C. Data types and expression evaluation. Programmer-defined functions including passing parameters by value and by address. Selection topics include if/else/else-if, conditional expressions, and switch. Repetition topics include while, do-while, for, and recursion. External file input and output. Arrays, analysis of searching and sorting algorithms, and strings. Pointers and dynamic memory allocation. Students are expected to complete assignments in a collaborative environment. CS 15800 may be used to satisfy College of Science requirement of participation in at least one team-building and collaboration experience. Typically offered Summer Fall Spring.

MA 26100 - Multivariate Calculus

Credit Hours: 4.00. Planes, lines, and curves in three dimensions. Differential calculus of several variables; multiple integrals. Introduction to vector calculus. Not open to students with credit in MA 17400 or MA 27100 . Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

15 Credits

Spring 2nd Year

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

MA 26200 - Linear Algebra And Differential Equations

Credit Hours: 4.00. Linear algebra, elements of differential equations. Not open to students with credit in MA 26500 or MA 26600. Typically offered Fall Spring Summer.

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

AGRY 43100 - Atmospheric Thermodynamics

Credit Hours: 3.00. (EAPS 42100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

AGRY 44100 - Synoptic Laboratory I

Credit Hours: 1.00. (EAPS 43100) Analysis of vertical distributions of temperature and moisture with applications to adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- UCC Humanities selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Written or Oral Communication selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

AGRY 43200 - Atmospheric Dynamics I

Credit Hours: 3.00. (EAPS 42200) A study of the general system of equations governing mass and momentum changes in the atmosphere; special horizontal wind representations; thermal wind relationships; circulation, vorticity, divergence, and vertical motion. Typically offered Spring.

AGRY 44200 - Synoptic Laboratory II

Credit Hours: 1.00. (EAPS 43200) Analysis of horizontal distributions of pressure, temperature, wind, vorticity, and vertical motions. Applications to synopticscale wave propagation. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 4.00

14 Credits

Fall 4th Year

AGRY 43300 - Atmospheric Dynamics II

Credit Hours: 3.00. (EAPS 42300) An extension of AGRY 43200 with the emphasis on perturbation theory and hydrodynamic stability, air mass and frontal theory, barotrophic and baroclinic models, wave cyclone theory, and numerical weather prediction. Typically offered Fall.

AGRY 44300 - Synoptic Laboratory III

Credit Hours: 1.00. (EAPS 43300) Diagnosis of midtropospheric wave propagation and growth. Analysis of surface pressure fields and fronts and their relationships to upper air features. Extensive use is made of teletype and facsimile weather information. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 53500 - Boundary Layer Meteorology

Credit Hours: 3.00. (EASP 52500) This course has required class trips. Students will pay individual lodging or meal expenses where necessary. A study of the physical nature of the lowest layers of the atmosphere. The energy balance concept and the

turbulent transfer of heat, momentum, and water vapor are discussed in detail. Some specific microclimates are studied in this context. Typically offered Spring.

AGRY 54500 - Remote Sensing Of Land Resources

Credit Hours: 3.00. Application of remote sensing and spatial databases for observing and managing land resources within the Earth System; analysis and interpretation of remotely sensed data in combination with field observations and other data sources; conceptualization and design of a global earth resources information system. Typically offered Fall.

EAPS 53500 - Atmospheric Observations And Measurements

Credit Hours: 3.00. A course that introduces students to direct and remotely sensed observations of the atmosphere. Directly measured quantities discussed include temperature, pressure, moisture, wind, solar radiation, chemical properties of the atmosphere, etc. Remote sensing of cloud, precipitation, and air motion by weather radars, satellites, profilers, lidars, and other emerging technologies is reviewed. Students will gain experience in observation techniques and data interpretation, and will learn uncertainty and error assessment. Prior course work in atmospheric science and statistics is required. Typically offered Fall.

14 Credits

Spring 4th Year

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 53600 - Environmental Biophysics

Credit Hours: 3.00. An analysis of the energy fluxes to and from terrestrial plants, insects, mammals, and humans as they exist in their macro and microclimates. Agricultural meteorology methods (both research and operational) will be presented. Labs will be both in-laboratory and in-field with reports required. A special project will be required of all students and will be presented in class and written as if for publication. Typically offered Spring.

EAPS 43400 - Weather Analysis And Forecasting

Credit Hours: 3.00. (AGRY 44400) In-depth study of contemporary weather analysis and forecasting techniques and problems. Extensive use is made of teletype and facsimile data and numerical weather prediction guidance provided by the National Meteorological Center. Typically offered Spring.

EAPS 53200 - Atmospheric Physics I

Credit Hours: 3.00. Cloud and precipitation physics and basic atmospheric radiative transfer. Introduction to computer aided problem solving. Typically offered Spring.

- Elective - Credit Hours: 3.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Crop Science, BS

About the Program

Crop science provides an education in the basic sciences, with applications in crop plant management and crop improvement. Opportunities are numerous and encompass a broad range in science, business, and education. Students are especially qualified for graduate study in plant nutrition, environmental science, crop physiology and ecology, biotechnology and plant genetics, and plant breeding.

Crop Science Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Crop Science include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (111-113 credits)

Required Major Courses (18 credits)

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal

aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

Other Departmental /Program Course Requirements (93-95 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 51500 - Plant Mineral Nutrition

Credit Hours: 3.00. Fundamental principles and concepts of the mineral nutrition of higher plants; processes and mechanisms controlling nutrient bioavailablilty and acquisition; physiological, genetic, and ecological aspects of plant nutrition including rhizosphere dynamics and interaction with disease. Offered in even-numbered years. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

AGRY 52500 - Crop Physiology And Ecology

Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Agronomy Selective (Science, Technology, & Society) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Agronomy Selective - Credit Hours: 6.00
- Business Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from

interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (9 credits)

- Elective - Credit Hours: 9.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

18 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Agronomy Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Elective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agronomy Selective - Credit Hours: 3.00
- Agronomy Selective (Science, Technology, and Society) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

17 Credits

Spring 3rd Year

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

- Written or Oral Communication Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

13 Credits

Fall 4th Year

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 51500 - Plant Mineral Nutrition

Credit Hours: 3.00. Fundamental principles and concepts of the mineral nutrition of higher plants; processes and mechanisms controlling nutrient bioavailablilty and acquisition; physiological, genetic, and ecological aspects of plant nutrition including rhizosphere dynamics and interaction with disease. Offered in even-numbered years. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

- Elective - Credit Hours: 3.00

14 Credits

Spring 4th Year

AGRY 52500 - Crop Physiology And Ecology

Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

- Business Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

12 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Plant Genetics, Breeding, and Biotechnology, BS

About the Program

Plant genetics, breeding, and biotechnology students are interested in agricultural biotechnology, genetic engineering, and research in genetic mechanisms that control crop growth and development. Students prepare for many research opportunities in industry and acquire the necessary background for graduate studies. Students also learn the fundamentals of genetics and practical plant breeding as well as the latest developments in genetic engineering, environmentally sound crop production practices, development of varieties appropriate for the agriculture of developing countries, and strategies for developing plant lines adapted to environmental stresses. Opportunities exist for training both in laboratory and field practices important to modern genetics research. A professional internship involving practical aspects of the option is required.

Plant Genetics, Breeding, and Biotechnology Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Plant Genetics, Breeding, & Biotechnology include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credit required for graduation

Departmental/Program Major Courses (108 to 114 credits)

Required Major Courses (18 credits)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 48000 - Plant Genetics

Credit Hours: 3.00. Principles and recent advances in plant genetics including: genetic segregation, linkage, DNA markers and applications, chromosomes and genomes, variation in chromosome number and structure, mutation, recombination and DNA repair, quantitatively inherited traits, introduction to principles of population genetics, gene expression, gene organization, regulation of gene activity, gene function, identifying important genes, cloning genes, reverse genetics, plant transformation, applications of genetic engineering, genome sequencing, using sequence data. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 52000 - Principles And Methods Of Plant Breeding

Credit Hours: 3.00. Introduction to methods and techniques of breeding field crops, with emphasis on the application of genetic principles; analysis of and present approach to the solution of specific breeding problems in selected field crops. Typically offered Fall.

Other Departmental /Program Course Requirements (90 to 96 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied

Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGR 29000 - Special Topics In Agriculture

Credit Hours: 0.00 to 3.00. Presentation of subject matter not available in other courses offered by the college. The specific topic that is offered will be indicated on the student's academic record. Typically offered Summer Fall Spring.

AGRY 52500 - Crop Physiology And Ecology

Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in

agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BTNY 42000 - Plant Cellular And Developmental Biology

Credit Hours: 3.00. This course will focus on the fundamentals of plant cellular and developmental biology. Topics to be covered include: the structure and function of plant organelles and membranes; the cell cycle; DNA, RNA and protein synthesis; the secretory pathway, and the cellular basis of development and whole plant morphogenesis. Typically offered Spring.

BIOL 41500 - Introduction To Molecular Biology

Credit Hours: 3.00. An introduction to modern molecular biology techniques and how they are used to address current topics in gene regulation. Emphasis will be placed on experimental procedures and model systems, such as site-directed mutagenesis of isolated genes and their subsequent introduction into prokaryotic and eukaryotic cells. Topics will address the molecular control

mechanisms associated with DNA replication, RNA transcription, RNA processing, and differential gene expression. Typically offered Fall.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of

definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16100 - Plane Analytic Geometry And Calculus I

Credit Hours: 5.00. Introduction to differential and integral calculus of one variable, with applications. Some schools or departments may allow only 4 credit hours toward graduation for this course. Designed for students who have not had at least a one-semester calculus course in high school, with a grade of "A" or "B". Not open to students with credit in MA 16500. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

MA 16200 - Plane Analytic Geometry And Calculus II

Credit Hours: 5.00. Continuation of MA 16100. Vectors in two and three dimensions, techniques of integration, infinite series, conic sections, polar coordinates, surfaces in three dimensions. Some schools or departments may allow only 4 credit hours toward graduation for this course. Typically offered Fall Spring Summer.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Directed Selective - Credit Hours: 9.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (6 to 12 credits)

- Elective (credits required depend on Math, Physics, & Physiology course choices) - Credit Hours: 6.00 to 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGR 29000 - Special Topics In Agriculture

Credit Hours: 0.00 to 3.00. Presentation of subject matter not available in other courses offered by the college. The specific topic that is offered will be indicated on the student's academic record. Typically offered Summer Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16100 - Plane Analytic Geometry And Calculus I

Credit Hours: 5.00. Introduction to differential and integral calculus of one variable, with applications. Some schools or departments may allow only 4 credit hours toward graduation for this course. Designed for students who have not had at least a one-semester calculus course in high school, with a grade of "A" or "B". Not open to students with credit in MA 16500. Demonstrated competence in college algebra and trigonometry. Typically offered Fall Spring Summer.

17 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

MA 16200 - Plane Analytic Geometry And Calculus II

Credit Hours: 5.00. Continuation of MA 16100. Vectors in two and three dimensions, techniques of integration, infinite series,

conic sections, polar coordinates, surfaces in three dimensions. Some schools or departments may allow only 4 credit hours toward graduation for this course. Typically offered Fall Spring Summer.

- Elective* - Credit Hours: 4.00

15 Credits

Fall 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- Economics Selective - Credit Hours: 3.00
- Directed Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 28500 - World Crop Adaptation And Distribution

Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PHYS 24100 - Electricity And Optics

Credit Hours: 3.00. Electrostatics, current electricity, electromagnetism, magnetic properties of matter. Electromagnetic waves, geometrical and physical optics. Typically offered Summer Fall Spring.

14 Credits

Fall 3rd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BTNY 42000 - Plant Cellular And Developmental Biology

Credit Hours: 3.00. This course will focus on the fundamentals of plant cellular and developmental biology. Topics to be covered include: the structure and function of plant organelles and membranes; the cell cycle; DNA, RNA and protein synthesis; the secretory pathway, and the cellular basis of development and whole plant morphogenesis. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00

13 Credits

Spring 3rd Year

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

- Directed Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 6.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

AGRY 48000 - Plant Genetics

Credit Hours: 3.00. Principles and recent advances in plant genetics including: genetic segregation, linkage, DNA markers and applications, chromosomes and genomes, variation in chromosome number and structure, mutation, recombination and DNA repair, quantitatively inherited traits, introduction to principles of population genetics, gene expression, gene organization, regulation of gene activity, gene function, identifying important genes, cloning genes, reverse genetics, plant transformation, applications of genetic engineering, genome sequencing, using sequence data. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 52000 - Principles And Methods Of Plant Breeding

Credit Hours: 3.00. Introduction to methods and techniques of breeding field crops, with emphasis on the application of genetic principles; analysis of and present approach to the solution of specific breeding problems in selected field crops. Typically offered Fall.

BIOL 41500 - Introduction To Molecular Biology

Credit Hours: 3.00. An introduction to modern molecular biology techniques and how they are used to address current topics in gene regulation. Emphasis will be placed on experimental procedures and model systems, such as site-directed mutagenesis of isolated genes and their subsequent introduction into prokaryotic and eukaryotic cells. Topics will address the molecular control mechanisms associated with DNA replication, RNA transcription, RNA processing, and differential gene expression. Typically offered Fall.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

AGRY 52500 - Crop Physiology And Ecology

Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Directed Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

14 Credits

Requirements

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Soil and Water Sciences, BS

About the Program

The Soil and Water Sciences option provides a strong science education, while preparing students to apply this knowledge in many technical phases of soil, water resources and environmental management. Opportunities are numerous and encompass a broad range in science, management, and education with diverse applications addressing agricultural water use, food security, soil and water quality and secure water supplies. Students are especially qualified for graduate study in hydrology, water resources, soil chemistry, soil physics, soil microbiology, environmental science, soil mineralogy and genesis, and ecology.

Soil and Water Sciences Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Soil and Water Sciences include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (109 to 110 credits)

Required Major Courses (29 to 30 credits)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (NRES 29000, EAPS 11300) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen.

Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

AGRY 34900 - Soil Ecology

Credit Hours: 3.00. An introductory course that will cover the basic concepts of soil ecology. Biological diversity and the interactions between and within biotic and abiotic components of the soil ecosystem, nutrient cycling, and genetic engineering are introduced. Typically offered Fall.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 45000 - Soil Conservation and Water Management

Credit Hours: 3.00. (NRES 45000) Principles of soil conservation with emphasis on control of soil erosion by wind and water; impact of soil management decisions on environment; soil-water-plant relations, includes agronomic aspects of water management for both irrigation and drainage. Typically offered Fall.

AGRY 58500 - Soils And Land Use

Credit Hours: 3.00. Soils as a resource in development planning; soil properties affecting land use; use of soil survey, aerial photos, topographic maps, and other resource data in land-use allocation; nonengineering aspects of site selection for various land uses, water conservation, waste disposal, and erosion control. Typically offered Spring.

AGRY 46500 - Soil Physical Properties

Credit Hours: 3.00. Physical properties and processes in soils; water flow, soil structure, chemical movement; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and plant growth. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 56500 - Soils And Landscapes

Credit Hours: 3.00. Soils as natural components of landscapes, geomorphology and soil characteristics; processes of soil formation; principal soils of Indiana, their adaptations, limitations, productivity and use; global soil distributions; application of GPS and mobile GIS in the field. This course requires two all-day field trips. Students will pay individual meal expenses when necessary. Typically offered Fall.

Other Departmental /Program Course Requirements (80 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied

Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

EAPS 11100 - Physical Geology

Credit Hours: 3.00. Geologic processes and the development of land forms. Laboratory covers the study of minerals and rocks, the interpretations of topographic and geologic maps, and field investigations. Typically offered Summer Fall Spring. CTL: Physical Geology

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Crop or Plant Science Selective - Credit Hours: 3.00
- Ecology Selective - Credit Hours: 3.00
- Engineering or Science Selective - Credit Hours: 3.00
- Agricultural Economics, Economics, Management or Organizational Leadership and Supervision Selective - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (10 or 11 credits)

- Elective - Credit Hours: 10.00 - 11.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11300 - Introduction To Agronomy Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (NRES 29000, EAPS 11300) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

AGRY 39800 - Agronomy Seminar

Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

- Crop or Plant Science Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of

problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- Ecology Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

AGRY 38500 - Environmental Soil Chemistry

Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

AGRY 34900 - Soil Ecology

Credit Hours: 3.00. An introductory course that will cover the basic concepts of soil ecology. Biological diversity and the interactions between and within biotic and abiotic components of the soil ecosystem, nutrient cycling, and genetic engineering are introduced. Typically offered Fall.

EAPS 11100 - Physical Geology

Credit Hours: 3.00. Geologic processes and the development of land forms. Laboratory covers the study of minerals and rocks, the interpretations of topographic and geologic maps, and field investigations. Typically offered Summer Fall Spring. CTL: Physical Geology

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

- UCC Humanities Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00 *

16 Credits

Spring 3rd Year

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Genetics or Crop Physiology and Ecology, or Biochemistry selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGRY 45000 - Soil Conservation and Water Management

Credit Hours: 3.00. (NRES 45000) Principles of soil conservation with emphasis on control of soil erosion by wind and water; impact of soil management decisions on environment; soil-water-plant relations, includes agronomic aspects of water management for both irrigation and drainage. Typically offered Fall.

AGRY 58500 - Soils And Land Use

Credit Hours: 3.00. Soils as a resource in development planning; soil properties affecting land use; use of soil survey, aerial photos, topographic maps, and other resource data in land-use allocation; nonengineering aspects of site selection for various land uses, water conservation, waste disposal, and erosion control. Typically offered Spring.

AGRY 46500 - Soil Physical Properties

Credit Hours: 3.00. Physical properties and processes in soils; water flow, soil structure, chemical movement; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and plant growth. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar

Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 56500 - Soils And Landscapes

Credit Hours: 3.00. Soils as natural components of landscapes, geomorphology and soil characteristics; processes of soil formation; principal soils of Indiana, their adaptations, limitations, productivity and use; global soil distributions; application of GPS and mobile GIS in the field. This course requires two all-day field trips. Students will pay individual meal expenses when necessary. Typically offered Fall.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

13 Credits

Spring 4th Year

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

- Engineering or Science Selective - Credit Hours: 3.00
- Agricultural Economics, Economics, Management or Organizational Leadership and Supervision Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Turf Management and Science, BS

About the Program

This major is for students interested in a career as a professional turf manager. A turf manager oversees and implements cultural management programs for the maintenance, production, conditioning and performance of a wide variety of turf areas like lawns, athletic fields, golf courses, parks, and sod farms. Managing a visually pleasing and manicured turf that is subject to intense use requires a foundation of technical expertise, the ability to make precise management decisions and a wealth of practical

experience. The Turf Science and Management curriculum is based in scientific principles, while also providing the technical information, business/management, written/oral communication, and problem solving coursework and skills to promote managerial success. This Bachelor of Science degree broadly prepares students to handle a wide array of potential career paths in the Turf Industry.

Turf Management and Science Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Turf Management & Science include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114 credits)

Required Major Courses (18 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11100 - Survey Of Turfgrass Culture

Credit Hours: 1.00. (AGRY 11000) A survey of the challenges and opportunities available in the turfgrass industry. Students will visit a wide range of turf sites to see turf problems and their solutions. Professional turf managers, upperclass undergraduate students, and faculty will share their experiences with the class to provide a broad perspective of the turf industry to the students. Typically offered Fall.

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21100 - Fundamentals of Turfgrass Culture Laboratory

Credit Hours: 1.00. (AGRY 21100) Companion lab to AGRY 21000. Laboratory exercises will focus on turfgrass and seed anatomy, morphology, identification as well as the hands-on basic principles of turfgrass culture. Designed for the student who intends to pursue a career in turfgrass management and plans to enroll in AGRY 51000. Enrollment preference will be given to Turfgrass Science Majors. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

AGRY 51000 - Turfgrass Science

Credit Hours: 3.00. An advanced course in turfgrass management which focuses on the management requirements of intensively cultured turfgrass areas, with a specific emphasis on golf course and athletic fields. Interrelationships among soil, plant and atmospheric environments, management practices and turfgrass quality will be stressed. Typically offered Fall.

AGRY 51200 - Integrated Turfgrass Systems

Credit Hours: 3.00. Integration of agronomic principles for professionally managing golf courses, athletic complexes, lawn care companies, and sod production facilities in an efficient and environmentally friendly manner. Emphasizes independent thinking and team cooperation for understanding the social, ethical, and economical aspects underlying the daily agronomic management decisions, including construction, establishment, cultural practices, fertilization, and pest management. Course meets for weeks 1-10. Typically offered Fall.

Other Departmental /Program Course Requirements (96 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

BTNY 44300 - Arthropods And Diseases Of Turfgrass

Credit Hours: 3.00. (ENTM 44300) This course is designed to introduce students to the biology, ecology, and management of

arthropods and diseases associated with turfgrass ecosystems. The course is divided into two discrete segments with a focus on arthropods during the first half of the semester and diseases during the second half of the semester. Typically offered Spring.

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Physics Selective - Credit Hours: 3.00
- Business/Management Selectives - Credit Hours: 12.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Turf Science Selectives - Credit hours: 10.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

AGRY 51400 - Environmental Stress Management For Turfgrass

Credit Hours: 1.00. Designed for students who desire an understanding of how environmental stresses influence turfgrass growth and how they can be managed with cultural practices. The course covers current research findings in stress management and integrates turfgrass environmental physiology with turfgrass management. Typically offered Fall.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (6 credits)

- Elective - Credit Hours: 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

HORT 11100 - Survey Of Turfgrass Culture

Credit Hours: 1.00. (AGRY 11000) A survey of the challenges and opportunities available in the turfgrass industry. Students will visit a wide range of turf sites to see turf problems and their solutions. Professional turf managers, upperclass undergraduate students, and faculty will share their experiences with the class to provide a broad perspective of the turf industry to the students. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology

will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

16 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

15 Credits

Fall 2nd Year

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21100 - Fundamentals of Turfgrass Culture Laboratory

Credit Hours: 1.00. (AGRY 21100) Companion lab to AGRY 21000. Laboratory exercises will focus on turfgrass and seed anatomy, morphology, identification as well as the hands-on basic principles of turfgrass culture. Designed for the student who intends to pursue a career in turfgrass management and plans to enroll in AGRY 51000. Enrollment preference will be given to Turfgrass Science Majors. Typically offered Spring.

- Business/Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

AGRY 51000 - Turfgrass Science

Credit Hours: 3.00. An advanced course in turfgrass management which focuses on the management requirements of intensively cultured turfgrass areas, with a specific emphasis on golf course and athletic fields. Interrelationships among soil, plant and atmospheric environments, management practices and turfgrass quality will be stressed. Typically offered Fall.

- Business/Management Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

BTNY 44300 - Arthropods And Diseases Of Turfgrass

Credit Hours: 3.00. (ENTM 44300) This course is designed to introduce students to the biology, ecology, and management of arthropods and diseases associated with turfgrass ecosystems. The course is divided into two discrete segments with a focus on arthropods during the first half of the semester and diseases during the second half of the semester. Typically offered Spring.

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

- Business Management Selective - Credit Hours: 3.00
- Physics Selective - Credit Hours: 3.00
- Turf Management Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

AGRY 51200 - Integrated Turfgrass Systems

Credit Hours: 3.00. Integration of agronomic principles for professionally managing golf courses, athletic complexes, lawn care companies, and sod production facilities in an efficient and environmentally friendly manner. Emphasizes independent thinking and team cooperation for understanding the social, ethical, and economical aspects underlying the daily agronomic management decisions, including construction, establishment, cultural practices, fertilization, and pest management. Course meets for weeks 1-10. Typically offered Fall.

AGRY 51400 - Environmental Stress Management For Turfgrass

Credit Hours: 1.00. Designed for students who desire an understanding of how environmental stresses influence turfgrass growth and how they can be managed with cultural practices. The course covers current research findings in stress management and integrates turfgrass environmental physiology with turfgrass management. Typically offered Fall.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

- Business/Management Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Spring 4th Year

- Turf Management Selective - Credit Hours: 3.00
- Turf Management Selective - Credit Hours: 3.00
- Turf Management Selective - Credit Hours: 1.00
- UCC Science, Technology & Society Selective - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Crop Science Minor

18 credits

Required Courses

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

AGRY 37500 - Crop Production Systems

Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

Selective List

(12 credits from the following)

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological

advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 37500 - Crop Production Systems

Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

AGRY 48000 - Plant Genetics

Credit Hours: 3.00. Principles and recent advances in plant genetics including: genetic segregation, linkage, DNA markers and applications, chromosomes and genomes, variation in chromosome number and structure, mutation, recombination and DNA repair, quantitatively inherited traits, introduction to principles of population genetics, gene expression, gene organization, regulation of gene activity, gene function, identifying important genes, cloning genes, reverse genetics, plant transformation, applications of genetic engineering, genome sequencing, using sequence data. Typically offered Fall.

AGRY 50500 - Forage Management

Credit Hours: 3.00. The study of the role of economically important crop species in the soil-plant-animal complex. Physiology, utilization, and management of forage species will be emphasized. Typically offered Spring.

AGRY 51500 - Plant Mineral Nutrition

Credit Hours: 3.00. Fundamental principles and concepts of the mineral nutrition of higher plants; processes and mechanisms controlling nutrient bioavailablilty and acquisition; physiological, genetic, and ecological aspects of plant nutrition including rhizosphere dynamics and interaction with disease. Offered in even-numbered years. Typically offered Fall.

AGRY 52000 - Principles And Methods Of Plant Breeding

Credit Hours: 3.00. Introduction to methods and techniques of breeding field crops, with emphasis on the application of genetic principles; analysis of and present approach to the solution of specific breeding problems in selected field crops. Typically offered Fall.

AGRY 52500 - Crop Physiology And Ecology

Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

Notes

Departmental permission is not required to enroll in this minor.

Students majoring in the Department of Agronomy cannot obtain a Crop Science minor.

* If not used above as a required course.

Soil Science Minor

18 credits

Required Courses

(6 credits)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply,

temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

Selectives

(12 credits from the following)

AGRY 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (NRES 29000, EAPS 11300) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 33700 - Environmental Hydrology

Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 33800 - Environmental Hydrology Laboratory

Credit Hours: 1.00. This laboratory course is designed to provide hands-on examples of the hydrologic concepts covered in the AGRY 33700 - Environmental Hydrology class and with practical experience in hydrologic field techniques. Typically offered Spring.

AGRY 34900 - Soil Ecology

Credit Hours: 3.00. An introductory course that will cover the basic concepts of soil ecology. Biological diversity and the interactions between and within biotic and abiotic components of the soil ecosystem, nutrient cycling, and genetic engineering are introduced. Typically offered Fall.

AGRY 35500 - Soil Morphology And Geography

Credit Hours: 2.00. This course features field experience in advanced techniques in soil morphology including the study of the relationship of soils to landscaped, common parent materials of Midwest and classification of soils in the Soil Taxonomy. Course material emphasizes the development of detailed descriptions of soil properties and how these properties directly impact the interpretations and recommendations for land use options. Use and management of soils based on landscape position and morphology will be covered including on-site waste disposal, homes with basements as well as road and street construction. Collegiate soil judging is a portion of the subject matter discussed. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

AGRY 45000 - Soil Conservation and Water Management

Credit Hours: 3.00. (NRES 45000) Principles of soil conservation with emphasis on control of soil erosion by wind and water; impact of soil management decisions on environment; soil-water-plant relations, includes agronomic aspects of water management for both irrigation and drainage. Typically offered Fall.

AGRY 46500 - Soil Physical Properties

Credit Hours: 3.00. Physical properties and processes in soils; water flow, soil structure, chemical movement; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and plant growth. Typically offered Fall.

AGRY 54000 - Soil Chemistry

Credit Hours: 3.00. Emphasis on processes controlling the gaseous, solution, and solid phases in soils including precipitation, acid-base, oxidation-reduction, complexation, absorption, and ion exchange. Typically offered Spring.

AGRY 54400 - Environmental Organic Chemistry

Credit Hours: 3.00. The fundamental properties and processes responsible for the fate of organic chemicals in the environment, with emphasis on soil and water chemistry. Areas to be addressed will include both conceptual and theoretical aspects of processes relevant to environmental fate of contaminants; measurement, estimation, correlation, and application of the parameters most commonly used to assess various chemodynamic properties in soil-water systems. Typically offered in spring semester of even-numbered years.

AGRY 54500 - Remote Sensing Of Land Resources

Credit Hours: 3.00. Application of remote sensing and spatial databases for observing and managing land resources within the Earth System; analysis and interpretation of remotely sensed data in combination with field observations and other data sources; conceptualization and design of a global earth resources information system. Typically offered Fall.

AGRY 55500 - Soil And Plant Analysis

Credit Hours: 3.00. Principles and methods of chemical analysis of plants and soils. Topics include soil carbon analysis, exchangeable cations, soil acidity, salinity, pesticide analysis, and elemental analysis of plant tissue and forage analysis. Quantitative gravimetric and volumetric techniques are reviewed followed by use of instrumental methods of analysis including atomic absorption, UV/Visible spectrometry, HPLC, and gas chromatography. Laboratory safety, quality assurance/quality control, and data reporting are emphasized. Students having at lease one year of chemistry including a quantitative analysis laboratory will be suitably prepared. Typically offered Spring.

AGRY 56000 - Soil Physics

Credit Hours: 3.00. Fundamentals of soil physics; transport of chemicals, heat, and gases; field spatial variability; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and agricultural production. Students having an understanding of introductory soil science will be suitably prepared. Typically offered Fall.

AGRY 56500 - Soils And Landscapes

Credit Hours: 3.00. Soils as natural components of landscapes, geomorphology and soil characteristics; processes of soil formation; principal soils of Indiana, their adaptations, limitations, productivity and use; global soil distributions; application of GPS and mobile GIS in the field. This course requires two all-day field trips. Students will pay individual meal expenses when necessary. Typically offered Fall.

AGRY 58000 - Soil Microbiology

Credit Hours: 3.00. The soil microbial population and its role in the soil ecosystem; microbial transformations of inorganic and organic compounds; decomposition of residues; and dynamics of soil organic matter. Typically offered Spring.

AGRY 58200 - Environmental Fate Of Pesticides

Credit Hours: 3.00. Emphasis is given to developing a fundamental understanding of the processes controlling the fate of organic chemicals, such as pesticides, in the environment. Processes considered include: volatilization, degradation, leaching, and sorption. Typically offered Spring.

AGRY 58500 - Soils And Land Use

Credit Hours: 3.00. Soils as a resource in development planning; soil properties affecting land use; use of soil survey, aerial photos, topographic maps, and other resource data in land-use allocation; nonengineering aspects of site selection for various land uses, water conservation, waste disposal, and erosion control. Typically offered Spring.

Notes

Departmental permission is not required to enroll in this minor.

Students majoring in the Department of Agronomy cannot obtain a Crop Science minor.

Department of Animal Sciences

Overview

The Purdue University Department of Animal Sciences promotes leadership and inspiration to educate students, enabling them to anticipate and effectively respond to challenges facing the global animal industries. The Animal Sciences faculty conducts relevant scientific research and facilitates technology transfer for efficient and sustainable production of high quality animal products, optimizing animal well-being, enhancing the human diet, and advancing sound environmental practices.

The vision of the Department of Animal Sciences is simple. We desire to be the "place to go" for the citizens of Indiana and beyond for knowledge in animal sciences. This includes students, commodity groups, industry partners, government agencies, consumers, and many others. Our shared goals are to:

- provide students with a rigorous and relevant education, preparing them for a lifetime of learning;
- achieve scientific preeminence in selected areas, and develop teams to identify and solve real world problems; and
- meet the needs of our diverse clientele making the best use of emerging technologies.

The Animal Sciences faculty has expertise in the disciplines of growth and development, nutrition, breeding and genetics, physiology, management, and animal well-being and behavior. In addition, scientists in the USDA Livestock Behavior Unit associated with Purdue are adjunct faculty members.

Concentrations include:

- Animal Agribusiness
- Behavior/Wellbeing
- Biosciences
- Preveterinary Medicine
- Production
- Products

Faculty

https://ag.purdue.edu/ansc/Pages/directory.aspx

Contact Information

Department of Animal Sciences

Purdue University

Lilly Hall of Life Sciences

915 W. State St.

West Lafayette, IN 47907

765-494-4843

Email: ansc4you@purdue.edu

Website:ag.purdue.edu/ansc

The Main office for the department is located in 2-111 of LILY Hall.

Animal Sciences: Animal Agribusiness Concentration, BS

About the Program

This Department of Animal Sciences option is best suited for those interested in business aspects of the animal industry and gaining knowledge in accounting, sales and marketing, and business management. Graduates are high in demand in sales and service areas of animal health products; feed, production, equipment firms; sales companies; and animal representatives for banks and lending organizations, insurance companies, marketing, advertising, and public relations agencies. You may be well suited for animal agribusiness if you enjoy meeting people, have a good oral communication skills as well as a proficiency in writing. Experience with raising and managing of animals is essential since you will be expected to interact and relate to managers, veterinarians, businessmen, and owners of animal enterprises. An interest in economics, marketing, and business management is important.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Animal Agribusiness include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (107-108 credits)

Required Major Courses (12 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits, 18 credits have to be 30000 or higher)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 3.00 - 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 2.00 - 3.00
- Animal Production/Management Selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 2.00 - 4.00
- Animal Sciences Selectives - Credit Hours: 4.00 - 8.00

Other Departmental /Program Course Requirements (75 credits)

(see ANSC Undergraduate Student Handbook)

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal

aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agricultural Economics, Economics, or Management Selective - Credit Hours: 12.00

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective (20000+level) - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness

- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density;

the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

15 Credits

Spring 1st Year

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

17 Credits

Fall 2nd Year

AGEC 20200 - Spreadsheet Use In Agricultural Business

Credit Hours: 1.00. Use of computer spreadsheets in business and financial analysis. Students gain capability to use financial, statistical, and logical spreadsheet functions and a wide variety of other spreadsheet capabilities. Accounting, finance, and management principles are put into practice in a spreadsheet environment. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

MGMT 20000 - Introductory Accounting

Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. CTL:IPO 1801 Accounting I

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

14 Credits

Fall 3rd Year

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agricultural Economics, Economics, or Management Selective - Credit Hours: 3.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

- Agricultural Economics, Economics, or Management Selective - Credit Hours: 3.00
- Animal Genetics Selective - Credit Hours: 4.00
- Animal Products Selective - Credit Hours: 3.00
- Animal Sciences Selective - Credit Hours: 2.00
- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Agricultural Economics, Economics, or Management Selective - Credit Hours: 3.00
- Animal Production/Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

15 Credits

Spring 4th Year

- Animal Sciences Selective - Credit Hours: 3.00
- Agricultural Economics, Economics, or Management Selective - Credit Hours: 3.00
- Electives - Credit Hours: 7.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Sciences: Behavior/Well-Being Concentration, BS

About the Program

Students desiring a balance of animal production, behavioral sciences, and well-being are best served by this option in the department of Animal Sciences. Careers available as managers of animal production units (e.g., beef cow-calf or feed lot manager, flock supervisor, swine manager or horse trainer or breeder). Limited career opportunities may be available as an animal trainer, zoo environmental enhancement specialist, companion animal consultant, breed association animal well-being specialist, and pet safety education specialist for a humane society. Students interested in advanced studies can become animal behavior consultants or scientists at universities.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Behavior/Well-Being include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (15 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 40400 - Animal Welfare

Credit Hours: 3.00. A multi-disciplinary course that introduces students to the fields of animal welfare and the ethics of animal use. The course will emphasize farm animal welfare and production issues. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits, 18 credits have to be 30000 or higher)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 3.00 - 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 2.00 - 3.00
- Animal Production/Management selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 2.00 - 4.00
- Animal Sciences Selectives - Credit Hours: 4.00 - 8.00

Other Departmental /Program Course Requirements (75 credits)

(see ANSC Undergraduate Student Handbook)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Behavior/Well-being Selective - Credit Hours: 9.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (9 credits)

- Elective - Credit Hours: 9.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of

definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Animal Sciences Selective - Credit Hours: 2.00
- Economics Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

ANSC 40400 - Animal Welfare

Credit Hours: 3.00. A multi-disciplinary course that introduces students to the fields of animal welfare and the ethics of animal use. The course will emphasize farm animal welfare and production issues. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Physiology Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Behavior/Well-being Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Animal Production/Management Selective - Credit Hours: 3.00
- Animal Sciences Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Behavior/Well-being Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15 Credits

Spring 4th Year

- Behavior/Well-being Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Sciences: Biosciences Concentration, BS

About the Program

The Department of Animal Sciences offers this specialization that is intended for students seeking careers in research or technical services related to animal nutrition, growth and development, animal genetics, reproduction, animal well-being, and management. Those in this specialization should have a strong interest in and curiosity in discovery and have enjoyed their high school biology, chemistry, mathematics, and physics courses. Students who aspire to careers in research and teaching in colleges and universities or in agribusinesses should enroll in this option. It can also be used as an excellent preparation for professional careers such as human medical doctors, veterinarians, dentists, and employment in the nutrition, genomics, and pharmaceutical industries. Graduates continuing for the M.S. or Ph.D. degrees in animal sciences qualify for numerous research, teaching, or extension positions in industry, government, universities, and colleges.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Biosciences include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (112 credits)

Required Major Courses (12 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 3.00
- Animal Production/Management selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 3.00
- Animal Sciences Selectives - Credit Hours: 5.00

Other Departmental /Program Course Requirements (79 credits)

(see ANSC Undergraduate Student Handbook)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but

are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Science Selective - Credit hours: 12.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (8 credits)

- Elective - Credit Hours: 8.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Animal Sciences Selective - Credit Hours: 2.00
- Economics Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Physiology Selective - Credit Hours: 3.00
- Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Animal Production/Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Animal Science Selective - Credit Hours: 3.00

- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15 Credits

Spring 4th Year

- Animal Products Selective - Credit Hours: 3.00
- Science Selectives - Credit Hours: 6.00
- Electives - Credit Hours: 4.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Sciences: Pre-Veterinary Medicine Concentration, BS

About the Program

The Department of Animal Sciences offers this specialization that is intended for students seeking careers in research or technical services related to animal nutrition, growth and development, animal genetics, reproduction, animal well-being, and management. Those in this specialization should have a strong interest in and curiosity in discovery and have enjoyed their high school

biology, chemistry, mathematics, and physics courses. Students who aspire to careers in research and teaching in colleges and universities or in agribusinesses should enroll in this option. It can also be used as an excellent preparation for professional careers such as human medical doctors, veterinarians, dentists, and employment in the nutrition, genomics, and pharmaceutical industries. Graduates continuing for the M.S. or Ph.D. degrees in animal sciences qualify for numerous research, teaching, or extension positions in industry, government, universities, and colleges.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Pre-Veterinary Medicine include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (117 credits)

Required Major Courses (12 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 3.00
- Animal Production/Management selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 3.00
- Animal Sciences Selectives - Credit Hours: 5.00

Other Departmental /Program Course Requirements (84 credits)

(see ANSC Undergraduate Student Handbook)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 23300 - Physics For Life Sciences I

Credit Hours: 4.00. Physics For Life Sciences I builds upon prerequisite knowledge in college level biology, chemistry, and mathematics to present introductory physics that will be useful for applying physical principles, insights, and problem solving approaches for students with life science majors. Content will feature the Newtonian framework with emphasis on friction, drag and viscosity, random motion and diffusion, fluid flow, the Coulomb force, molecular forces and bonding, momentum, conservation of energy, entropy, and the first and second laws of thermodynamics. Typically offered Fall Spring Summer.

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PHYS 23400 - Physics For Life Sciences II

Credit hours: 4.00. Physics For Life Sciences II builds upon prerequisite knowledge in college level biology, chemistry, and mathematics, as well as on Physics of Life Sciences I, to develop an understanding of how energy, entropy, enthalpy, and Boltzmann distributions affect the dynamics of living systems, of how electric fields and potentials are applied to fluids and

membranes, and how the physics of harmonic oscillators, waves, sound, optics, photons, and quantized states are relevant to biological systems and the tools used for their study. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

VM 10200 - Careers In Veterinary Medicine

Credit Hours: 1.00. Overview of the field of veterinary medicine presently and as anticipated for the future. Presentations will include descriptions and discussions of the nature of the professional activity, organization of veterinary medicine, career opportunities, issues confronting the profession, and the admission requirements of the profession. Typically offered Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (3 credits)

- Elective: Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

VM 10200 - Careers In Veterinary Medicine

Credit Hours: 1.00. Overview of the field of veterinary medicine presently and as anticipated for the future. Presentations will include descriptions and discussions of the nature of the professional activity, organization of veterinary medicine, career opportunities, issues confronting the profession, and the admission requirements of the profession. Typically offered Spring.

16 Credits

Fall 2nd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

16 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

- Animal Sciences Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 23300 - Physics For Life Sciences I

Credit Hours: 4.00. Physics For Life Sciences I builds upon prerequisite knowledge in college level biology, chemistry, and mathematics to present introductory physics that will be useful for applying physical principles, insights, and problem solving approaches for students with life science majors. Content will feature the Newtonian framework with emphasis on friction, drag and viscosity, random motion and diffusion, fluid flow, the Coulomb force, molecular forces and bonding, momentum, conservation of energy, entropy, and the first and second laws of thermodynamics. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Physiology Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PHYS 23400 - Physics For Life Sciences II

Credit hours: 4.00. Physics For Life Sciences II builds upon prerequisite knowledge in college level biology, chemistry, and mathematics, as well as on Physics of Life Sciences I, to develop an understanding of how energy, entropy, enthalpy, and Boltzmann distributions affect the dynamics of living systems, of how electric fields and potentials are applied to fluids and membranes, and how the physics of harmonic oscillators, waves, sound, optics, photons, and quantized states are relevant to biological systems and the tools used for their study. Typically offered Fall Spring Summer.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

- Humanities or Social Science Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00

14 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Production/Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Spring 4th Year

- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 3.00
- Animal Sciences Selective - Credit Hours: 2.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Sciences: Production Concentration, BS

About the Program

Opportunities associated with this Department of Animal Sciences option include the leadership and management of any enterprise that deals with the daily production and care of animals. This could include food animal species of beef or dairy cattle, chickens, ducks, fish, sheep, swine, or turkeys or many companion animal species including cats, dogs, horses, and many exotic

or zoo animals. This option is the best balance of science, business, and the enterprise management subjects designed to prepare someone to manage live animals. Enterprises might be owned by the graduate's family, the graduate, or any agribusiness company. Graduates of this option often serve as technical support staff for input companies, as field or services representatives in various commodity organizations, livestock sale companies, or procurement officers for meat processing companies. You may be well suited for an animal production management career if you enjoy working with and supervising people, have good oral communication and problem-solving skills as well as competencies working with animals directly. Experience with the raising and managing of animals is essential since you will be expected to interact and relate to managers, veterinarians, business representatives, and owners of animal enterprises.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Production include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (12 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 3.00 - 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 2.00 - 3.00
- Animal Production/Management selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 2.00 - 4.00
- Animal Sciences Selectives - Credit Hours: 4.00 - 8.00

Other Departmental /Program Course Requirements (75 credits)

(see ANSC Undergraduate Student Handbook)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure,

spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Financial Management Selective - Credit Hours: 3.00
- Enterprise Management Selective - Credit Hours: 3.00
- Enterprise Management Selective - Credit Hours: 3.00
- Production/Management Selective (Non-ANSC) - Credit Hours: 3.00
- Production/Management Selective (Non-ANSC) - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

15 Credits

Spring 1st Year

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 2.00

16 Credits

Fall 2nd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

- Animal Sciences Selective - Credit Hours: 3.00
- Financial Management Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Products Selective - Credit Hours: 3.00
- Enterprise Management Selective - Credit Hours: 3.00
- Production/Management Selective (Non-ANSC) - Credit Hours: 3.00

13 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Animal Production/Management Selective - Credit Hours: 3.00
- Animal Sciences Selective - Credit Hours: 2.00
- Enterprise Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Production/Management Selective (Non-ANSC) - Credit Hours: 3.00
- Electives - Credit Hours: 7.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Sciences: Products Concentration, BS

About the Program

This Department of Animal Sciences option is meant to prepare students who are interested in the live animal production of quality animal products combined with the ever-growing further processing industry of safe, healthful food. Opportunities include product-development managers; meat scientists; live-animal procurement managers; and sales positions in milk, egg, or meat processing industries. Many graduates become graders and inspectors at the farm or manufacturing level for milk, meat and eggs; commercial and seedstock animal production evaluators and breeders; or university or industry researchers and product developers. Graduates continuing for the M.S. or Ph.D. degree in growth and development, food science, agricultural economics, or muscle biology qualify for numerous research, teaching, or extension positions in industry, government, universities, and colleges. You should enjoy the challenge of applying basic information to the solution of practical problems as well as the challenges of working in the consumer-driven food industries.

Animal Sciences (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Animal Sciences: Products include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (100-101 credits)

Required Major Courses (12 credits)

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

ANSC Restricted Selectives (21 credits)

(see ANSC Undergraduate Student Handbook)

- Animal Genetics Selective - Credit Hours: 3.00 - 4.00
- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Physiology Selective - Credit Hours: 2.00 - 3.00
- Animal Production/Management selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 2.00 - 4.00
- Animal Sciences Selectives - Credit Hours: 4.00 - 8.00

Other Departmental /Program Course Requirements (67-68 credits)

(see ANSC Undergraduate Student Handbook)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure,

spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Business Management Selective - Credit Hours: 3.00
- Food Science Selective - Credit Hours: 3.00 - 4.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (19-20 credits)

- Elective - Credit Hours: 19.00 - 20.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11400 - Introduction to Animal Sciences Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Animal Sciences. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

15 Credits

Spring 1st Year

ANSC 18100 - Orientation To Animal Sciences

Credit Hours: 1.00. Introduction to the faculty, programs, opportunities, career preparation, and personal development requirements needed to succeed in a career in the animal industries. Course meets during weeks 1-8. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 1.00

14 Credits

Fall 2nd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

- Business Management Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

- Animal Sciences Selective - Credit Hours: 3.00

14 Credits

Fall 3rd Year

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of

microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Nutrition Selective - Credit Hours: 3.00
- Animal Products Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- Animal Genetics Selective - Credit Hours: 4.00
- Animal Physiology Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 4.00

14 Credits

Fall 4th Year

ANSC 48100 - Contemporary Issues in Animal Sciences

Credit Hours: 1.00. Industry-led and student-led discussions and debate of current issues facing animal industries. Experiences from internships, research problems, study abroad, or job shadowing will be shared among the students. Course meets during weeks 1-8. Typically offered Fall.

- Animal Production/Management Selective - Credit Hours: 3.00
- Food Science Selective - Credit Hours: 3.00 - 4.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

15-16 Credits

Spring 4th Year

- Animal Sciences Selective - Credit Hours: 2.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 9.00 - 10.00

14-15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Animal Science Minor

18 credits

Nutrition

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

Physiology

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

BIOL 20300 - Human Anatomy And Physiology

Credit Hours: 4.00. A survey of normal structure and function of the human organism. The human is treated as an open system with the capacity to transport material, transform energy, and maintain a homeostatic state. The capacities and limitations of the human to cope with changes in the environment are emphasized. All major systems of the human body and their functions are examined in relation to the living organism. Integrated into the study of the human organism are laboratory exercises that emphasize the essentials of human anatomy and physiology. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall.

BIOL 20400 - Human Anatomy And Physiology

Credit Hours: 4.00. Continuation of BIOL 20300. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Spring.

Genetics

ANSC 31100 - Animal Breeding

Credit Hours: 4.00. Genetic principles and their applications in improvement of production efficiency in livestock. Typically offered Fall Spring.

ANSC 51100 - Population Genetics

Credit Hours: 3.00. (AGRY 51100, FNR 51100) Basic concepts of population genetics. Characterization of populations using gene frequencies, gametic and zygotic disequilibrium; forces changing gene frequencies (mutation, migration, selection, and random genetic drift) and genotypic frequencies (mating systems: inbreeding, crossbreeding, and phenotypic assortative) and related hypothesis testing; gene trees and the coalescent process; and molecular phylogenies. Typically offered Fall.

ANSC 51400 - Animal Biotechnology

Credit Hours: 3.00. Presentation and discussion of the history, developments, and applications of molecular genetic analysis of human and animal genomes, and use of gene transfer in research, animal agriculture, and human medicine. Ethical and economical ramifications of biotechnology in society will be introduced through reading assignments and discussion. Typically offered Fall.

BIOL 41500 - Introduction To Molecular Biology

Credit Hours: 3.00. An introduction to modern molecular biology techniques and how they are used to address current topics in gene regulation. Emphasis will be placed on experimental procedures and model systems, such as site-directed mutagenesis of isolated genes and their subsequent introduction into prokaryotic and eukaryotic cells. Topics will address the molecular control mechanisms associated with DNA replication, RNA transcription, RNA processing, and differential gene expression. Typically offered Fall.

Products

ANSC 30100 - Animal Growth, Development, And Evaluation

Credit Hours: 4.00. A study of meat animal growth and developmental processes, including micro and gross anatomy, and factors that affect body/carcass composition with application to animal and carcass evaluation. Typically offered Fall.

ANSC 35100 - Meat Science

Credit Hours: 3.00. Study of muscle and meat, principles involved in the conversion of living animals to meat and by-products; efficient utilization of all types of meat as food. Typically offered Spring.

Notes

Departmental permission is not required to enroll in this minor.

The remainder of the eighteen credits may be completed from other courses listed above, or from Animal Sciences (ANSC) courses that are numbered 30100 or higher. Not more than four total credits from ANSC 37000, ANSC 37100, ANSC 37200, ANSC 47000, ANSC 47100, and ANSC 47200 may be used. Only one of the physiology courses listed above may be used to satisfy the minor.

Students must achieve a minimum 2.00 grade point average in graded ANSC courses to meet minimum requirements for the Animal Sciences academic minor.

Department of Biochemistry

Overview

The Department of Biochemistry is a vibrant research community with widespread, multidisciplinary collaborations. We offer both undergraduate and graduate programs with emphasis on research excellence in broad areas of science. The field of biochemistry has historically focused on molecular dissection of biological molecules and cellular pathways. Our current faculty build upon this classical approach, using cutting-edge approaches ranging from genome-wide transcriptional analyses, state-of-the-art mass spectroscopy, and x-ray crystallography in a variety of model systems including bacteria, fungi, plants and fruit flies. These approaches allow our researchers to link real world problems such as energy production and human disease prevention to defects in basic molecular processes, tackling the most pressing issues in society.

Faculty

https://ag.purdue.edu/biochem/department/Pages/OurFaculty.aspx

Contact Information

Department of Biochemistry
Purdue University

Biochemistry Building
175 South University Street
West Lafayette, IN 47907-2063
Phone: 765-494-1600

Email: biochem-boilers@purdue.edu

Website: ag.purdue.edu/biochem

The Main office for the department is located in Room 120 of the BCHM Building.

Graduate Information

For Graduate Information please see Biochemistry Graduate Program Information.

Biochemistry, BS

About the Program

Biochemistry, the chemistry of living things, addresses the basic materials and processes of life itself. Biochemists investigate the chemical nature of such fundamental processes as the regulation of gene expression, the hormonal control of cell proliferation and differentiation. Knowledge of the molecular underpinnings of biological materials allows us to understand life processes and solve basic biological problems.

Students in the Department of Biochemistry, historically situated in the College of Agriculture, enjoy close mentoring by faculty through smaller class sizes and academic advising. Another strength of our program is that we strongly promote hands-on

research and critical thinking skills. All students in the department participate in undergraduate research supervised by a faculty member.

There is also an opportunity to complete a five-year dual degree with biological engineering following acceptance into the College of Engineering.

How to apply to Biochemistry in the College of Agriculture

Biochemistry Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biochemistry include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114 credits)

Required Major Courses (25 credits)

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

Other Departmental /Program Course Requirements (89 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are

transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic

probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Science Selective - Credit Hours: 5.00 - 9.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (6 credits)

- Elective - Credit Hours: 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2

- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Spring 1st Year

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 1.00

15 Credits

Fall 2nd Year

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds.

Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

15 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

16 Credits

Fall 3rd Year

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career

planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- UCC Humanities Selective - Credit Hours: 3.00

14 Credits

Spring 3rd Year

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

- Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Fall 4th Year

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

- Economics Selective - Credit Hours: 3.00
- Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 4th Year

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

- Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biochemistry: Pre-Med Concentration, BS

About the Program

Biochemistry, the chemistry of living things, addresses the basic materials and processes of life itself. Biochemists investigate the chemical nature of such fundamental processes as the regulation of gene expression, the hormonal control of cell proliferation

and differentiation. Knowledge of the molecular underpinnings of biological materials allows us to understand life processes and solve basic biological problems.

Students in the Department of Biochemistry, historically situated in the College of Agriculture, enjoy close mentoring by faculty through smaller class sizes and academic advising. Another strength of our program is that we strongly promote hands-on research and critical thinking skills. All students in the department participate in undergraduate research supervised by a faculty member.

There is also an opportunity to complete a five-year dual degree with biological engineering following acceptance into the College of Engineering.

How to apply to Biochemistry in the College of Agriculture

Biochemistry Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biochemistry: Pre-Med include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114-117 credits)

Required Major Courses (25 credits)

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

Other Departmental /Program Course Requirements (89-92 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 13500 - First year Biology Laboratory

Credit Hours: 2.00. Laboratory exercises emphasizing student mastery of basic laboratory skills needed to succeed in the biological sciences; intended for beginning (first-year) biology majors. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

BIOL 30100 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A study of human function, emphasizing physiology of body tissues and systems. Relevant aspects of anatomy and histology are also included. Use of examples from current medical practice encourages application of knowledge to predict symptoms of disease and rationale for treatment. Topics covered include histophysiology of cells and tissues, nerve and muscle physiology, the nervous system, and cardiovascular dynamics. Typically offered Fall.

BIOL 20300 - Human Anatomy And Physiology

Credit Hours: 4.00. A survey of normal structure and function of the human organism. The human is treated as an open system with the capacity to transport material, transform energy, and maintain a homeostatic state. The capacities and limitations of the human to cope with changes in the environment are emphasized. All major systems of the human body and their functions are examined in relation to the living organism. Integrated into the study of the human organism are laboratory exercises that emphasize the essentials of human anatomy and physiology. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall.

BIOL 30200 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A continuation of BIOL 30100. (It is helpful but not essential for this course to be preceded by BIOL 30100.) Topics covered include body fluids and renal function, respiration, endocrine systems, the gastro-intestinal system, exercise physiology, reproduction, and immunity. Typically offered Spring.

BIOL 20400 - Human Anatomy And Physiology

Credit Hours: 4.00. Continuation of BIOL 20300. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Spring.

BIOL 39600 - Premedical Planning Seminar

Credit Hours: 0.00. This course is designed for sophomore and junior students who are planning to attend medical school. The course offers information and advice on the MCAT, the application process, the personal statement, the interview, and letters of recommendation. Students in the course will also formulate an alternative career plan. The course meets the first 10 weeks of the semester. Typically offered Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PSY 12000 - Elementary Psychology

Credit Hours: 3.00. Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, abnormal behavior, attention, perception, learning, memory, and thinking. As part of their learning experience, students participate in psychological experiments. Typically offered Fall Spring Summer. CTL:ISH 1020 Introduction To Psychology

SOC 10000 - Introductory Sociology

Credit Hours: 3.00. A survey course designed to introduce the student to the scene of human society. Fundamental concepts, description, and analysis of society, culture, the socialization process, social institutions, and social change. Students of junior or senior standing should take SOC 31200, unless they are sociology or law and society majors. Typically offered Fall Spring Summer. CTL:ISH 1060 Introduction To Sociology

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Science Selective - Credit Hours: 0.00 - 1.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (6 credits)

- Elective - Credit Hours: 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree.

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 13500 - First year Biology Laboratory

Credit Hours: 2.00. Laboratory exercises emphasizing student mastery of basic laboratory skills needed to succeed in the biological sciences; intended for beginning (first-year) biology majors. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students

majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 2.00

16 Credits

Fall 2nd Year

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

15 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

16 Credits

Fall 3rd Year

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

SOC 10000 - Introductory Sociology

Credit Hours: 3.00. A survey course designed to introduce the student to the scene of human society. Fundamental concepts, description, and analysis of society, culture, the socialization process, social institutions, and social change. Students of junior or senior standing should take SOC 31200, unless they are sociology or law and society majors. Typically offered Fall Spring Summer. CTL:ISH 1060 Introduction To Sociology

14 Credits

Spring 3rd Year

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BIOL 39600 - Premedical Planning Seminar

Credit Hours: 0.00. This course is designed for sophomore and junior students who are planning to attend medical school. The course offers information and advice on the MCAT, the application process, the personal statement, the interview, and letters of recommendation. Students in the course will also formulate an alternative career plan. The course meets the first 10 weeks of the semester. Typically offered Spring.

- Science Selective - Credit Hour: 1.00

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

PSY 12000 - Elementary Psychology

Credit Hours: 3.00. Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, abnormal behavior, attention, perception, learning, memory, and thinking. As part of their learning experience, students participate in psychological experiments. Typically offered Fall Spring Summer. CTL:ISH 1020 Introduction To Psychology

- Elective - Credit Hours: 3.00

- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BIOL 30100 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A study of human function, emphasizing physiology of body tissues and systems. Relevant aspects of anatomy and histology are also included. Use of examples from current medical practice encourages application of knowledge to predict symptoms of disease and rationale for treatment. Topics covered include histophysiology of cells and tissues, nerve and muscle physiology, the nervous system, and cardiovascular dynamics. Typically offered Fall.

BIOL 20300 - Human Anatomy And Physiology

Credit Hours: 4.00. A survey of normal structure and function of the human organism. The human is treated as an open system with the capacity to transport material, transform energy, and maintain a homeostatic state. The capacities and limitations of the human to cope with changes in the environment are emphasized. All major systems of the human body and their functions are examined in relation to the living organism. Integrated into the study of the human organism are laboratory exercises that emphasize the essentials of human anatomy and physiology. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall.

- Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

16 Credits

Spring 4th Year

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

BIOL 30200 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A continuation of BIOL 30100. (It is helpful but not essential for this course to be preceded by BIOL 30100.) Topics covered include body fluids and renal function, respiration, endocrine systems, the gastro-intestinal system, exercise physiology, reproduction, and immunity. Typically offered Spring.

BIOL 20400 - Human Anatomy And Physiology

Credit Hours: 4.00. Continuation of BIOL 20300. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biochemistry: Pre-Vet Concentration, BS

About the Program

Biochemistry, the chemistry of living things, addresses the basic materials and processes of life itself. Biochemists investigate the chemical nature of such fundamental processes as the regulation of gene expression, the hormonal control of cell proliferation and differentiation. Knowledge of the molecular underpinnings of biological materials allows us to understand life processes and solve basic biological problems.

Students in the Department of Biochemistry, historically situated in the College of Agriculture, enjoy close mentoring by faculty through smaller class sizes and academic advising. Another strength of our program is that we strongly promote hands-on research and critical thinking skills. All students in the department participate in undergraduate research supervised by a faculty member.

There is also an opportunity to complete a five-year dual degree with biological engineering following acceptance into the College of Engineering.

How to apply to Biochemistry in the College of Agriculture

Biochemistry Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Biochemistry: Pre-Vet include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (115 credits)

Required Major Courses (25 credits)

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

Other Departmental /Program Course Requirements (90-92 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 13500 - First year Biology Laboratory

Credit Hours: 2.00. Laboratory exercises emphasizing student mastery of basic laboratory skills needed to succeed in the biological sciences; intended for beginning (first-year) biology majors. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic

probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

VM 10200 - Careers In Veterinary Medicine

Credit Hours: 1.00. Overview of the field of veterinary medicine presently and as anticipated for the future. Presentations will include descriptions and discussions of the nature of the professional activity, organization of veterinary medicine, career opportunities, issues confronting the profession, and the admission requirements of the profession. Typically offered Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (5 credits)

- Elective - Credit Hours: 5.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11500 - Introduction To Biochemistry Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Biochemistry. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

BIOL 12100 - Biology I: Diversity, Ecology, And Behavior

Credit Hours: 2.00. Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior. Typically offered Fall.

BIOL 13500 - First year Biology Laboratory

Credit Hours: 2.00. Laboratory exercises emphasizing student mastery of basic laboratory skills needed to succeed in the biological sciences; intended for beginning (first-year) biology majors. Typically offered Fall Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

Credit Hours: 3.00. Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms. Typically offered Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 2.00

16 Credits

Fall 2nd Year

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

CHM 25500 - Organic Chemistry

Credit Hours: 3.00. A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates. Recommended for biology majors. Typically offered Fall Spring.

CHM 25501 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments to accompany CHM 25500, illustrating methods of separation, instrumental methods of analysis, and the more common techniques and methods for preparing various types of organic compounds. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT

30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

15 Credits

Spring 2nd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 25601 - Organic Chemistry Laboratory

Credit Hours: 1.00. A continuation of CHM 25501. Experiments are designed to illustrate principles discussed in CHM 25600. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

16 Credits

Fall 3rd Year

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer

software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 39000 - Professional Development Seminar

Credit Hours: 1.00. The objective of this course is to help biochemistry students with professional development and career planning. Students will learn about career possibilities, interview skills, job search strategies, graduate and professional school applications, resume construction and industrial practices. Intended for juniors. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- UCC Humanities Selective - Credit Hours: 3.00

14 Credits

Spring 3rd Year

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

VM 10200 - Careers In Veterinary Medicine

Credit Hours: 1.00. Overview of the field of veterinary medicine presently and as anticipated for the future. Presentations will include descriptions and discussions of the nature of the professional activity, organization of veterinary medicine, career opportunities, issues confronting the profession, and the admission requirements of the profession. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

14 Credits

Spring 4th Year

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

CHM 37200 - Physical Chemistry

Credit Hours: 4.00. Principles of physical chemistry with emphasis on chemical thermodynamics and kinetics, illustrated examples from the biological sciences. Intended primarily for students in the life sciences. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Biochemistry Minor

18-19 credits

Recommended Plan of Study

Required Courses

BCHM 10000 - Introduction To Biochemistry

Credit Hours: 2.00. A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all students and does not require any college science courses as background or prerequisite. Typically offered Fall.

CHM 25600 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides. Typically offered Fall Spring.

CHM 26200 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 26100, but a broader scope. The chemistry of a variety of functional groups is discussed. Theory is employed extensively to demonstrate the coherence underlying seemingly diverse transformations. Qualitative organic analysis is introduced, with particular emphasis on spectroscopic methods. Typically offered Spring.

CHM 26605 - Organic Chemistry

Credit Hours: 3.00. A continuation of CHM 26505, but a broader scope. The chemistry of a variety of functional groups is discussed. Theory is employed extensively to demonstrate the coherence underlying seemingly diverse transformations. Qualitative organic analysis is introduced, with particular emphasis on spectroscopic methods. Typically offered Spring.

MCMP 20500 - Organic Chemistry II

Credit Hours: 4.00. Continuation of MCMP 20400. Typically offered Fall.

BCHM 36100 - Molecules

Credit Hours: 3.00. A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism. Typically offered Spring.

BCHM 56100 - General Biochemistry I

Credit Hours: 3.00. This course provides upper-division undergraduate and graduate students with basic understanding of biochemical and structural properties of amino acids, nucleic acids, lipids, and carbohydrates. This course allows students to connect the relationship between structure and function of biomolecules. In addition, students learn to understand enzyme properties, enzyme mechanism of action, and enzyme regulation. Typically offered Fall.

BCHM 46200 - Metabolism

Credit Hours: 3.00. A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease. Typically offered Fall.

BCHM 56200 - General Biochemistry II

Credit Hours: 3.00. This course provides upper-division undergraduate and graduate students with an understanding of core metabolic pathways. Anabolic and catabolic processes of metabolic pathways are studied. Biochemical and structural knowledge is used to determine how enzymes and coenzymes are needed to regulate and control metabolic pathways. Typically offered Spring.

Selective Courses

Seven credits must be completed from the following courses.

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

CHM 32100 - Analytical Chemistry I

Credit Hours: 4.00. Quantitative measurements on complex chemical systems that show matrix effects or require isolation of a component prior to its determination; general approaches to quantitative problems at the trace level; critical comparisons of competitive procedures with emphasis on principles of separation processes, including chromatography; recognition and evaluation of possible sources of error; approaches for optimizing conditions so as to minimize time and/or effort required to attain prescribed levels of accuracy and precision. Required of students majoring in chemistry. Typically offered Fall.

BCHM 29000 - Experimental Design Seminar

Credit Hours: 2.00. Introduction to fundamentals of scientific principles and practice in biochemistry. Students will learn how to develop hypotheses, design experiments, and critically analyze results to create new knowledge. Intended for sophomores. Typically offered Spring.

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 46300 - Macromolecular Machines

Credit Hours: 3.00. A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function. Typically offered Fall.

BCHM 46500 - Biochemistry Of Life Processes

Credit Hours: 2.00. Major questions in biochemistry and contemporary approaches to these problems. Material covered in class will primarily be derived from primary literature. Students will continue to develop the skills needed to critically read, evaluate, and assimilate the primary scientific literature. Typically offered Spring.

BCHM 49000 - Undergraduate Seminar

Credit Hours: 1.00. Discussion of individual student's research projects. Preparation of posters and public seminars based upon research results. Permission of instructor required. Typically offered Spring.

BCHM 49800 - Research In Biochemistry

Credit Hours: 1.00 to 4.00. Supervised individual research. This course is intended to provide the opportunity for in-depth, independent undergraduate research. The students enrolled in this course will learn how to devise hypotheses, design experiments that test their hypotheses, record their data in laboratory notebooks, critically analyze the results of their analyses, and present their findings to others in written form. Permission of instructor required. Typically offered Fall Spring Summer.

Notes

Departmental permission is not required for this minor.

Department of Botany and Plant Pathology

Overview

Welcome to the Department of Botany and Plant Pathology at Purdue University.

Research, teaching and extension have been an integral part of the Department of Botany and Plant Pathology since 1887. Today's department includes 23 faculty who are advancing and teaching the disciplines of Plant Biology, Plant Pathology and Weed Science.

Explore our web site and see the opportunities our department offers. Learn how you can do more to protect the environment, apply genetic knowledge to improve plants, manage natural resources, control weeds, or diagnose plant diseases with a degree from Purdue's Botany and Plant Pathology department.

Faculty

https://ag.purdue.edu/btny/Pages/directorygroup.aspx

Contact Information

Department of Botany and Plant Pathology
Purdue University
Lilly Hall of Life Sciences
915 West State Street
West Lafayette, IN 47907-2054
Phone: 765.494.4614
E-mail: botany@purdue.edu

Website: https://ag.purdue.edu/btny/Pages/default.aspx

The main office for the department is located in Room 1-446 of LILY Hall.

Graduate Information

For Graduate Information please see Botany and Plant Pathology Graduate Program Information.

Plant Science, BS

About the Program

This major is designed for students who are interested in the biology of plants: how they grow, develop and evolve; the interactions of plants with other organisms and their role in the environment; how to manage plants that are grown for food, fiber and fuel. Our major allows students to develop expertise in these areas, prepare for a career in fields such as biotechnology and environmental management, and move forward to advanced graduate studies.

Plant Science Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Plant Science include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (99 credits)

Required Major Courses (21 credits)

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic

importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 20700 - The Microbial World

Credit Hours: 3.00. This course delivers a broad synthesis of microbiology, discussing all taxa of the microbial world. The course also discusses a wide range of subjects related to microbiology, including medical microbiology, but it has a strong emphasis on the botanical and environmental sciences. One particular characteristic that separates it from other microbiology courses is the reduced emphasis upon bacteriology, with discussions of the protists and viruses and, especially of the fungi, occurring in greater detail than the other general microbiology courses available. Typically offered Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

BTNY 49700 - Undergraduate Seminar

Credit Hours: 1.00. Problem-based seminar drawing on students' experience in undergraduate research. Preparation of seminar and poster presentations based on problem analysis relevant to careers in plant biology, environmental plant science, and crop protection. Instruction on problem analysis, scientific writing, and presentation skills are combined with career development activities, including invited speakers from industry, academia, and government. With prior approval and in consultation with the instructor, a student may substitute a problem based on study abroad, an undergraduate course project, or supervised internship or other supervised work-related experience. Typically offered Spring.

BTNY 49800 - Research In Plant Science

Credit Hours: 1.00 to 3.00. Supervised individual laboratory or field research. A written report of work accomplished will be required. May be repeated once for credit. Permission of instructor required. Typically offered Fall Spring Summer.

Other Departmental /Program Course Requirements (78 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12500 - Introduction To Plant Science

Credit Hours: 1.00. An introduction to the academic programs offered in plant science. Topics include, but are not limited to, undergraduate plans of study, courses, and experiential programs including undergraduate research opportunities, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis.

Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Focus Selective - Credit Hours: 18.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
  Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selective - Credit Hours: 3.00

Electives (21 credits)

Elective - Credit Hours: 21.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12500 - Introduction To Plant Science

Credit Hours: 1.00. An introduction to the academic programs offered in plant science. Topics include, but are not limited to, undergraduate plans of study, courses, and experiential programs including undergraduate research opportunities, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

BTNY 20700 - The Microbial World

Credit Hours: 3.00. This course delivers a broad synthesis of microbiology, discussing all taxa of the microbial world. The course also discusses a wide range of subjects related to microbiology, including medical microbiology, but it has a strong emphasis on the botanical and environmental sciences. One particular characteristic that separates it from other microbiology courses is the reduced emphasis upon bacteriology, with discussions of the protists and viruses and, especially of the fungi, occurring in greater detail than the other general microbiology courses available. Typically offered Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

- Economics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

17 Credits

Fall 2nd Year

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

- Focus Selective - Credit Hours: 3.00
- UCC Humanities selective - Credit Hours: 3.00

14 Credits

Spring 2nd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

- UCC Science, Technology, & Society Selective - Credit Hours: 3.00
- Focus Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Focus Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Focus Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 4th Year

BTNY 49800 - Research In Plant Science

Credit Hours: 1.00 to 3.00. Supervised individual laboratory or field research. A written report of work accomplished will be required. May be repeated once for credit. Permission of instructor required. Typically offered Fall Spring Summer.

- Focus Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

15 Credits

Spring 4th Year

BTNY 49700 - Undergraduate Seminar

Credit Hours: 1.00. Problem-based seminar drawing on students' experience in undergraduate research. Preparation of seminar

and poster presentations based on problem analysis relevant to careers in plant biology, environmental plant science, and crop protection. Instruction on problem analysis, scientific writing, and presentation skills are combined with career development activities, including invited speakers from industry, academia, and government. With prior approval and in consultation with the instructor, a student may substitute a problem based on study abroad, an undergraduate course project, or supervised internship or other supervised work-related experience. Typically offered Spring.

- Focus Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Plant Biology Minor

15 credits

Required Courses

(4 credits)

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic

importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

Selectives

(11 credits from the following list)

BIOL 59500 - Special Assignments

Arrange Hours and Credit. Special work, such as directed reading, independent study or research, supervised library, laboratory, or field work, or presentation of material not available in the formal courses of the department. The field in which work is offered will be indicated in the student's record. Permission of instructor required. Typically offered Fall Spring Summer.

BTNY 21100 - Plants And The Environment

Credit Hours: 3.00. Plants are essential to environmental and human health, and the issues related to these interactions have received much public attention. This course provides the scientific basis for issues-related topics such as the impact of plants on biodiversity; how plants affect and are affected by global climate changes and pollution; the role of plants as invasive species; ways in which plants can help solve environmental problems; and the consequences of human manipulation of plants (e.g. genetic engineering, bioremediation) on plant communities and ecosystems. . Typically offered Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

BTNY 49800 - Research In Plant Science

Credit Hours: 1.00 to 3.00. Supervised individual laboratory or field research. A written report of work accomplished will be required. May be repeated once for credit. Permission of instructor required. Typically offered Fall Spring Summer.

BTNY 55000 - Biology Of Fungi

Credit Hours: 3.00. Lectures cover general features of fungi, unique characteristics of major fungal groups, fungal interactions with other organisms, and principles of fungal genetics. Lab exercises include examination of representative species from major groups of fungi and classical and molecular manipulations of fungi. (Offered in odd-numbered years.). Typically offered Fall.

BTNY 55300 - Plant Growth And Development

Credit Hours: 3.00. (HORT 55300) Topics include seed dormancy, cell expansion and plant growth, pattern formation, phase transition, flowering, pollination and fertilization, seed development, fruit development, and senescence. This course is the second in a series of team-taught courses in the core curriculum of the Purdue Plant Biology Program. Typically offered Spring.

BTNY 55500 - Aquatic Botany

Credit Hours: 3.00. This course has required class trips. Students will pay individual lodging or meal expenses where necessary. The study of algae and higher plants of the aquatic environment with emphasis on identification, morphology, ecology, role as pollutants, physiology, and control. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

*A maximum of three credits of BTNY 49800 or comparable research in the plant sciences may be applied to the minor.

Plant Pathology Minor

19 credits

Required Courses

(13 credits)

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 52500 - Intermediate Plant Pathology

Credit Hours: 3.00. Examines the biological and pathological characteristics of major causal agents; concepts of epidemiology and disease assessment; physiology, genetics, and molecular biology of host-pathogen interactions; disease management practices; and methods of disease diagnosis. Typically offered Fall.

BTNY 53500 - Plant Disease Management

Credit Hours: 3.00. An examination of the current principles, strategies, and technologies used in plant disease control. Emphasis is placed on the integration of various technologies and strategies for efficacious, environmentally sound management principles

for specific types of plant diseases. Major topics include plant disease management through regulatory procedures, pathogen exclusion, pathogen eradication, environmental modification, host modification, host resistance, cultural practices, host protectants, plant disease forecasting, and the epidemiological basis of disease management strategies. Typically offered Spring.

Selectives

(6 credits from the following)

BTNY 49800 - Research In Plant Science

Credit Hours: 1.00 to 3.00. Supervised individual laboratory or field research. A written report of work accomplished will be required. May be repeated once for credit. Permission of instructor required. Typically offered Fall Spring Summer.

BTNY 51700 - Diseases Of Agronomic Crops

Credit Hours: 1.00. This five-week miniclass teaches students the disease cycles and principles and practices for identifying and managing diseases of agronomic crops. The course is designed for students in plant protection, agronomy, entomology, and other areas who desire an intensive study of diseases of agronomic crops grown in Indiana. Primary emphasis is given to symptomatology, etiology, and disease management through in-depth study of major diseases affecting corn, soybeans, small grains, and forage crops. Special emphasis is placed on the practical aspects of IPM management systems. Weeks 11-15. Typically offered Fall.

BTNY 55000 - Biology Of Fungi

Credit Hours: 3.00. Lectures cover general features of fungi, unique characteristics of major fungal groups, fungal interactions with other organisms, and principles of fungal genetics. Lab exercises include examination of representative species from major groups of fungi and classical and molecular manipulations of fungi. (Offered in odd-numbered years.). Typically offered Fall.

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

* A maximum of three credits of BTNY 49800 or comparable research in the plant sciences may be applied to the minor.

Weed Science Minor

15 credits

Required Courses

(10 credits)

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

BTNY 50400 - Advanced Weed Science

Credit Hours: 3.00. Emphasizes the mode and mechanism of herbicide action and herbicide interaction with plants, and the biology and ecology of weedy plants. Offered in odd-numbered years. Typically offered Fall.

BTNY 50500 - Advanced Biology Of Weeds

Credit Hours: 3.00. Principles of weed biology and ecology, with focus on reproduction and ecophysiology, population dynamics, community ecology, and ecosystem level phenomena. Instruction will emphasize the development and refinement of critical thinking skills. Offered in even-numbered years. Typically offered Fall.

Selectives

(5 credits from the following)

BTNY 20400 - Crop and Weed Identification

Credit Hours: 1.00 or 2.00. (AGRY 20400) The identification by sight of plant mounts and seeds of over 200 crops and weeds is taught. The first eight weeks, which covers restricted weeds, prohibited noxious weeds, common weeds, and seed diseases, can

be taken for one credit; the last eight weeks covers cereals, grass and legume forages, and legume crops. The list of species to be studied for two credits is obtained from the Intercollegiate Crops Judging Manual. The species to be covered for one credit include the above-listed weeds and additional weed specimens pertinent to the weeds contest. The use and origins of the species are discussed briefly. Suggested course in preparation for AGRY 30500 - Seed Analysis And Grain Grading. Typically offered Spring.

BTNY 21100 - Plants And The Environment

Credit Hours: 3.00. Plants are essential to environmental and human health, and the issues related to these interactions have received much public attention. This course provides the scientific basis for issues-related topics such as the impact of plants on biodiversity; how plants affect and are affected by global climate changes and pollution; the role of plants as invasive species; ways in which plants can help solve environmental problems; and the consequences of human manipulation of plants (e.g. genetic engineering, bioremediation) on plant communities and ecosystems. . Typically offered Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

BTNY 49800 - Research In Plant Science

Credit Hours: 1.00 to 3.00. Supervised individual laboratory or field research. A written report of work accomplished will be required. May be repeated once for credit. Permission of instructor required. Typically offered Fall Spring Summer.

BTNY 55500 - Aquatic Botany

Credit Hours: 3.00. This course has required class trips. Students will pay individual lodging or meal expenses where necessary. The study of algae and higher plants of the aquatic environment with emphasis on identification, morphology, ecology, role as pollutants, physiology, and control. Typically offered Fall.

BTNY 55600 - Aquatic Plant Management

Credit Hours: 1.00. This five-week miniclass is designed to teach students the principles and practices for identifying and managing the algae and aquatic plants that inhabit Midwestern ponds and lakes. The majority of the course involves control practices and includes the option of taking the test to become certified in aquatic pesticide application (category 5). The establishment and maintenance of aquatic plants in constructed wetlands and water gardens are also covered. (Offered in alternate years.) (Course meets during weeks 1-5.). Typically offered Fall.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

Notes

Department permission is not required to enroll in this minor.

*A maximum of three credits of BTNY 49800 or comparable research in the plant sciences may be applied to the minor.

Department of Entomology

Overview

Vision

To be a leader recognized worldwide for the solutions and discoveries generated through the application of science focused on arthropod and nematode biology.

Mission

To improve the quality of life for the state, nation and the world by advancing scientific knowledge through the development and application of arthropod/ nematode science.

Core Values

- Strive to be pace setting in everything we do
- Encourage the highest standards of ethics and citizenship
- Operate in an open, objective, and inclusive environment
- A community of scholars committed to excellence and teamwork
- Promote the synergism that comes from interdisciplinary interactions
- Value our human capital
- Embrace and promote increased diversity
- Adopt emerging information and other technologies as tools - not final solutions
- Resolve to actively disseminate our knowledge to people of all ages

Faculty

https://ag.purdue.edu/entm/Pages/FacultyDirectory.aspx

Contact Information

Department of Entomology
Purdue University
Smith Hall
901 West State Street
West Lafayette, IN 47907
Phone: (765) 494-4554
Email: bugs@purdue.edu

Website: https://www.entm.purdue.edu/Undergrad/index.html

The Main office for the department is located in Room 127 of SMTH Hall.

Graduate Information

For Graduate Information please see Entomology Graduate Program Information.

Insect Biology, BS

About the Program

Insect Biology Majors study insects and related organisms. The program emphasizes "hands on learning" with opportunities for faculty mentored undergraduate research, field and laboratory experiences and study abroad options. Insect biologists apply knowledge and modern technology to address grand challenges including protection of human and animal health, food, and property, and natural environments. Insect biologists work as scientists, educators, technicians, consultants, and specialists in urban, agricultural, and natural environments to prevent the spread of disease, feed the world, promote biodiversity, protect the environment, solve crimes, strengthen biosecurity, and teach science. Careers are as diverse as the insects we study.

Entomology Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Insect Biology include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (106 credits)

Required Major Courses (18 credits)

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

ENTM 21000 - Introduction To Insect Behavior

Credit Hours: 3.00. Description and introductory analysis of innate and learned insect behavior, including basic orientations and movements, behavioral periodicity, communication, chemical and structural defenses, host selection and feeding, reproduction, and insect societies. General biology and introductory entomology are desirable, but not essential. Typically offered Spring.

ENTM 33500 - Introduction To Insect Identification

Credit Hours: 4.00. This class is designed for learning more about the collection and identification of adult insects. Emphasis will be placed on collection and sampling techniques, the preparation of specimens for future study, and identification. Typically offered Fall.

ENTM 31100 - Insect Ecology

Credit Hours: 3.00. Insect ecology investigates the fundamental concepts of ecology as they relate to insects, including insect interactions, other insects and their environment. Topics include population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and theoretical and applied ecology. Examples from current entomological and ecological studies are used. Completion of college biology or an introductory course in entomology is recommended. Typically offered Spring.

ENTM 49200 - Capstone Experience Entomology I

Credit Hours: 1.00. Requirements, options, procedures and skills needed for a successful Entomology capstone experience with emphasis on techniques and guidelines for formulating projects and principles of organizing and presenting information. A capstone experience proposal is produced. Typically offered Fall.

ENTM 49300 - Capstone Experience In Entomology II

Credit Hours: 1.00 to 3.00. Students complete capstone requirement for a project and oral and written communication about the capstone project. Permission of instructor required. Typically offered Summer Fall Spring.

ENTM 55100 - Insect Physiology And Biochemistry

Credit Hours: 3.00. Basic physiology and biochemistry of insects covering development, functions of internal systems, and interactions of insects with their environments. An introductory course in entomology, or familiarity with insects, and concurrent enrollment in a biochemistry course is recommended. Offered in even-numbered years. Typically offered Spring.

Major Selectives (6 credits)

- ENTM Selective - Credit Hours: 3.00
- ENTM Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (82 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11700 - Introduction To Entomology Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Entomology. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00
- Calculus Selective (satisfies Quantitative Reasoning for core) - Credit Hours: 3.00 ♦
- Philosophy, Logic or Critical Thinking Selective - Credit Hours: 3.00

- Insect Pest Management Selective - Credit Hours: 3.00
- Interdisciplinary Science Selectives - Credit Hours: 12.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (14 credits)

- Electives - Credit Hours: 14.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning

- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11700 - Introduction To Entomology Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Entomology. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density;

the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

- Interdisciplinary Science Selective - Credit Hours: 3.00
- Calculus Selective - Credit Hours: 3.00 ♦

16 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

ENTM 21000 - Introduction To Insect Behavior

Credit Hours: 3.00. Description and introductory analysis of innate and learned insect behavior, including basic orientations and movements, behavioral periodicity, communication, chemical and structural defenses, host selection and feeding, reproduction, and insect societies. General biology and introductory entomology are desirable, but not essential. Typically offered Spring.

- Biological Science Selective - Credit Hours: 4.00

14 Credits

Fall 2nd Year

ENTM 33500 - Introduction To Insect Identification

Credit Hours: 4.00. This class is designed for learning more about the collection and identification of adult insects. Emphasis will be placed on collection and sampling techniques, the preparation of specimens for future study, and identification. Typically offered Fall.

- Biological Sciences Selective - Credit Hours: 4.00
- Entomology Selective - Credit Hours: 4.00
- UCC Humanities Selective - Credit Hours: 3.00

14 Credits

Spring 2nd Year

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 31100 - Insect Ecology

Credit Hours: 3.00. Insect ecology investigates the fundamental concepts of ecology as they relate to insects, including insect interactions, other insects and their environment. Topics include population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and theoretical and applied ecology. Examples from current entomological and ecological studies are used. Completion of college biology or an introductory course in entomology is recommended. Typically offered Spring.

PHYS 21400 - The Nature Of Physics

Credit Hours: 3.00. Development of basic concepts and theories in physics; a terminal survey course designed for non-science majors. Typically offered Fall Spring. CTL:IPS 1750 Survey Of Physical Science

- Economics Selective - Credit Hours: 3.00

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

NRES 29000 - Introduction To Environmental Science

Credit Hours: 3.00. (EAPS 11300, AGRY 29000) An introduction to environmental science, including issues such as air and water pollution, toxic waste disposal, soil erosion, natural hazards, climate change, energy resources, and environmental planning. Includes extensive in-class discussion of case studies. Typically offered Fall.

16 Credits

Fall 3rd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

ENTM 49200 - Capstone Experience Entomology I

Credit Hours: 1.00. Requirements, options, procedures and skills needed for a successful Entomology capstone experience with emphasis on techniques and guidelines for formulating projects and principles of organizing and presenting information. A capstone experience proposal is produced. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Insect Pest Management Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

- Interdisciplinary Science Selective - Credit Hours: 3.00

ENTM 55100 - Insect Physiology And Biochemistry

Credit Hours: 3.00. Basic physiology and biochemistry of insects covering development, functions of internal systems, and interactions of insects with their environments. An introductory course in entomology, or familiarity with insects, and concurrent enrollment in a biochemistry course is recommended. Offered in even-numbered years. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 4th Year

- Entomology Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Interdisciplinary Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

ENTM 49300 - Capstone Experience In Entomology II

Credit Hours: 1.00 to 3.00. Students complete capstone requirement for a project and oral and written communication about the capstone project. Permission of instructor required. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Interdisciplinary Science Selective - Credit Hours: 3.00
- Philosophy, Logic or Critical Thinking Selective - Credit Hours: 3.00
- Electives - Credit Hours: 5.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Entomology Minor

16 Credits

Required Courses

(7 credits)

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

ENTM 33500 - Introduction To Insect Identification

Credit Hours: 4.00. This class is designed for learning more about the collection and identification of adult insects. Emphasis will be placed on collection and sampling techniques, the preparation of specimens for future study, and identification. Typically offered Fall.

Insect Biology

Minimum of three credits

ENTM 21000 - Introduction To Insect Behavior

Credit Hours: 3.00. Description and introductory analysis of innate and learned insect behavior, including basic orientations and movements, behavioral periodicity, communication, chemical and structural defenses, host selection and feeding, reproduction, and insect societies. General biology and introductory entomology are desirable, but not essential. Typically offered Spring.

ENTM 31100 - Insect Ecology

Credit Hours: 3.00. Insect ecology investigates the fundamental concepts of ecology as they relate to insects, including insect interactions, other insects and their environment. Topics include population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and theoretical and applied ecology. Examples from current entomological and ecological studies are used. Completion of college biology or an introductory course in entomology is recommended. Typically offered Spring.

ENTM 55100 - Insect Physiology And Biochemistry

Credit Hours: 3.00. Basic physiology and biochemistry of insects covering development, functions of internal systems, and interactions of insects with their environments. An introductory course in entomology, or familiarity with insects, and concurrent enrollment in a biochemistry course is recommended. Offered in even-numbered years. Typically offered Spring.

Insect Management

Minimum of three credits

ENTM 44100 - Forest Entomology

Credit Hours: 3.00. (FNR 44100) An introduction to the identity, natural history and management of insects affecting forest ecosystems. Topics include biodiversity, natural history and ecology of forest pests; forecasting and assessing the risk of insect outbreaks; and silvicultural, biological and chemical strategies for preventing and managing insect pests. Offered in odd-numbered years. Typically offered Fall.

ENTM 44300 - Arthropods And Diseases Of Turfgrass

Credit Hours: 3.00. (BTNY 44300) The course is designed to introduce students to the biology, ecology, and management of arthropods and diseases associated with turfgrass ecosystems. The course is divided into two discrete segments with a focus on arthropods during the first half of the semester and diseases during the second half of the semester. Typically offered Spring.

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders

of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

ENTM 51000 - Insect Pest Management

Credit Hours: 3.00. Concepts of pest management and dynamics of pest populations, with emphasis on population regulation in theory and practice. The principles of applied ecology that pertain to insects and agricultural crops and systems. Identification, biology, behavior, and relationships of pests of forage, fiber, and vegetable crops. A knowledge of introductory entomology is recommended. Offered in even-numbered years. Typically offered Fall.

ENTM 52500 - Medical And Veterinary Entomology

Credit Hours: 3.00. Introduction to the biology and control of arthropods of medical and veterinary importance, and coverage of the natural history and abatement of selected arthropod-related diseases, including arboviral encephalitis, filariasis, leishmaniasis, Lyme disease, malaria, plague, spotted fever, trypanosomiasis, and myasis. Offered in odd-numbered years. Typically offered Spring.

Selectives*

ENTM 10500 - Insects: Friend And Foe

Credit Hours: 3.00. A one-semester course for nonscience students who want to know more about insects - the most numerous organisms on earth. An introduction to insects and their relationship with humankind, including interesting aspects of insect biology; insects in music, decoration, history; use of insects in teaching at the elementary school level; their use in art, photography, and drawing; insects as human food. Typically offered Fall Spring.

ENTM 35100 - Bee Biology And Bee Keeping

Credit Hours: 3.00. A course that covers aspects of honey bee biology and agriculture intended for anyone interested in learning the necessary knowledge, skills, and confidence to become a hobby beekeeper. Colony life, social insects, bee behavior and anatomy, colony management, pollination and honey production are major topics studied. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

* In addition to the above courses, credits from the following courses can be applied to the total 16 credits required for a minor.

Forensic Sciences Minor

20 credits

Watch the Forensic Science Video.

Required Courses

ENTM 22810 - Forensic Investigation

Credit Hours: 4.00. Forensic science investigation, crime scene management and field data collection techniques. Includes crime scene recognition and the documentation, collection, preservation, and processing of crime scene evidence. Emphasizes the place of field data collection as the first step in a sequence that takes evidence from scene to the lab for analysis and finally into the court of law. Typically offered Fall.

ENTM 22820 - Forensic Analysis

Credit Hours: 4.00. Forensic science evidence analysis, crime lab evidence management and data analysis techniques. Focuses on the accuracy, precision and integrity in evidence analysis for a survey of forensic disciplines. Emphasizes the place of forensic analysis as a necessary second step in a sequence that takes evidence from scene, to the lab for analysis and finally into the court of law. Typically offered Spring

ENTM 22830 - Forensic Testimony And Ethics

Credit Hours: 3.00. The final course in the forensic science program core, focuses on the legal ramifications that arise when forensic science is applied at the crime scene, in the crime lab and in the courtroom. Students are introduced to ethical issues that form the basis of all scientific investigations and the role of scientists as expert witnesses in maintaining the moral integrity of our justice system. Typically offered Fall.

Selective Courses

(9 credits from the following)

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate

Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

ANTH 30500 - Ethnographic Methods

Credit Hours: 3.00. This course introduces students to the basic methods of ethnographic research: the collection, analysis, and presentation of data derived from the systematic, direct observation of human behavior and interviewing of key informants. Students are required to complete a field project. Typically offered Fall Spring.

ANTH 31000 - Mortuary Practices Across Cultures

Credit Hours: 3.00. Explores how death is treated or has been treated in diverse world cultures and time periods. Death is viewed as an expression of social behavior and as an expression of symbolic meaning. Typically offered Summer Fall Spring.

ANTH 33600 - Human Variation

Credit Hours: 3.00. Biological differences between human individuals and groups, causes of variations, the role of genetics, concepts of race, and the interrelationship between the social and biological meanings of race will be considered. Typically offered Fall Spring.

ANTH 42500 - Anthropological Archaeology

Credit Hours: 3.00. Introduction to the theory and methods of contemporary American archaeology. Basic field and laboratory methods are placed in the context of theoretical viewpoints and problems. Major theoretical issues in the field are explored, showing the integration of American archaeology with anthropology. Typically offered Summer Fall Spring.

ANTH 42800 - Field Methods In Archaeology

Credit Hours: 1.0 to 9.0. Introduces basic field and laboratory methods in contemporary archaeology: methods of site survey, mapping, and excavation through the excavation of archaeological sites; the basics of archaeological data analysis and classification, and the computer-based analysis of archaeological data. Permission of instructor required. Typically offered Summer.

ANTH 43600 - Human Evolution

Credit Hours: 3.00. This class examines the fossil evidence for human evolution and theories proposed to explain the development that led from the origin of primates to modern humans. This course will include lectures, exercises with fossil casts, presentation, and discussions. Typically offered Summer Fall Spring.

ANTH 53400 - Human Osteology

Credit Hours: 3.00. Anatomy of the human skeleton and dentition. Detailed study of skeletal elements and teeth, morphology, function, disease, and pathology. Identification of human remains with regard to age at death, gender, growth, and development in biocultural context. Typically offered Fall Spring.

ANTH 53500 - Foundations Of Biological Anthropology

Credit Hours: 3.00. This course covers such topics important in Biological anthropology as applied to both living and extinct humans and primates. Possible topics include: evolutionary thought; genetics, race, and human variation; the intersection of biology and culture; fossils and paleoanthropology; ecology and speciation; primate behavior; and theories on the social behavior of early humans. Typically offered Fall.

ANTH 58900 - Archaeology And Materials Science

Credit Hours: 3.00. This course provides instruction in the methods and theories used by archaeologists and materials scientists to study ancient and historic technology. The course focuses on the analysis and interpretation of archaeological artifacts and provides opportunities for hands-on learning. Typically offered Fall Spring.

ANTH 59200 - Selected Topics In Anthropology

Credit Hours: 1.00 to 3.00. Topics vary. Typically offered Fall Spring Summer.

BCHM 22100 - Analytical Biochemistry

Credit Hours: 3.00. Discussion of qualitative and quantitative analysis of biological compounds including pH measurement and control, spectrophotometry, measurement of radioactivity; theoretical basis of various separation techniques, including chromatography and electrophoresis; application of these methods to separation and analysis of biological compounds. Laboratory sessions will provide practical experience in the use of these methods. This course is designed for biochemistry majors. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BCHM 32200 - Analytical Biochemistry II

Credit Hours: 2.00. Modern biochemical techniques for the purification and characterization of biological macromolecules, with a focus on proteins and nucleic acids. This is a project-oriented course where students begin by purifying an enzyme by chromatography and then characterizing various aspects of the enzyme and its gene throughout the semester. Emphasis will be placed on quantitative analysis of properties such as enzymatic activity, molecular interactions, and gene expression as well as the principles of designing assays to measure biochemical phenomena. Use of bioinformatics tools and common computer software for data mining and to facilitate data analysis will be integrated. The course will culminate with preparation of a manuscript-style report describing the enzyme/gene characterization. Typically offered Fall Spring.

BCHM 56100 - General Biochemistry I

Credit Hours: 3.00. This course provides upper-division undergraduate and graduate students with basic understanding of biochemical and structural properties of amino acids, nucleic acids, lipids, and carbohydrates. This course allows students to connect the relationship between structure and function of biomolecules. In addition, students learn to understand enzyme properties, enzyme mechanism of action, and enzyme regulation. Typically offered Fall.

BCHM 56200 - General Biochemistry II

Credit Hours: 3.00. This course provides upper-division undergraduate and graduate students with an understanding of core metabolic pathways. Anabolic and catabolic processes of metabolic pathways are studied. Biochemical and structural knowledge is used to determine how enzymes and coenzymes are needed to regulate and control metabolic pathways. Typically offered Spring.

BIOL 20300 - Human Anatomy And Physiology

Credit Hours: 4.00. A survey of normal structure and function of the human organism. The human is treated as an open system with the capacity to transport material, transform energy, and maintain a homeostatic state. The capacities and limitations of the human to cope with changes in the environment are emphasized. All major systems of the human body and their functions are examined in relation to the living organism. Integrated into the study of the human organism are laboratory exercises that

emphasize the essentials of human anatomy and physiology. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall.

BIOL 20400 - Human Anatomy And Physiology

Credit Hours: 4.00. Continuation of BIOL 20300. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

BIOL 23100 - Biology III: Cell Structure And Function

Credit Hours: 3.00. An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function. Typically offered Fall.

BIOL 23200 - Laboratory In Biology III: Cell Structure And Function

Credit Hours: 2.00. Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components. Typically offered Fall.

BIOL 24100 - Biology IV: Genetics And Molecular Biology

Credit Hours: 3.00. An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in the genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology). Typically offered Spring.

BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

Credit Hours: 2.00. Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology. Typically offered Spring.

BIOL 30100 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A study of human function, emphasizing physiology of body tissues and systems. Relevant aspects of anatomy and histology are also included. Use of examples from current medical practice encourages application of knowledge to predict symptoms of disease and rationale for treatment. Topics covered include histophysiology of cells and tissues, nerve and muscle physiology, the nervous system, and cardiovascular dynamics. Typically offered Fall.

BIOL 30200 - Human Design: Anatomy And Physiology

Credit Hours: 3.00. A continuation of BIOL 30100. (It is helpful but not essential for this course to be preceded by BIOL 30100.) Topics covered include body fluids and renal function, respiration, endocrine systems, the gastro-intestinal system, exercise physiology, reproduction, and immunity. Typically offered Spring.

BIOL 41500 - Introduction To Molecular Biology

Credit Hours: 3.00. An introduction to modern molecular biology techniques and how they are used to address current topics in gene regulation. Emphasis will be placed on experimental procedures and model systems, such as site-directed mutagenesis of isolated genes and their subsequent introduction into prokaryotic and eukaryotic cells. Topics will address the molecular control mechanisms associated with DNA replication, RNA transcription, RNA processing, and differential gene expression. Typically offered Fall.

BIOL 43800 - General Microbiology

Credit Hours: 3.00. An examination of microbial diversity that emphasizes the interrelationship of bacteria and their environments. This includes aspects of cell composition, metabolism, and growth of microorganisms. Typically offered Fall.

BIOL 43900 - Laboratory In General Microbiology

Credit Hours: 2.00. Includes enrichment cultures to isolate microorganisms, studies of cell composition, measurements of cell growth, and examination of enzyme regulation. Typically offered Fall.

BIOL 44400 - Human Genetics

Credit Hours: 3.00. An intermediate-level survey course of human genetics with a balanced review of both Mendelian and molecular aspects. Review of current development and application of DNA technology emphasized. Typically offered Fall.

BIOL 47800 - Introduction to Bioinformatics

Credit Hours: 3.00. (CS 47800) Bioinformatics is broadly defined as the study of molecular biological information, targeting particularly the enormous volume of DNA sequence and functional complexity embedded in entire genomes. Topics will include understanding the evolutionary organization of genes (genomics), the structure and function of gene products (proteomics), and

the dynamics of gene expression in biological processes (transcriptomics). Inherently, bioinformatics is interdisciplinary, melding various applications of computational science with biology. This jointly taught course introduces analytical methods from biology, statistics and computer science that are necessary for bioinformatics investigations. The course is intended for junior and senior undergraduates from various science backgrounds. Our objective is to develop the skills of both tool users and tool designers in this important new field of research. Typically offered Fall.

BIOL 49500 - Special Assignments

Arrange Hours and Credit. Readings, discussions, written reports, seminar presentations, and field or laboratory work provided for enrichment in special areas of the biological sciences. Permission of instructor required. Typically offered Fall Spring Summer.

BIOL 58000 - Evolution

Credit Hours: 3.00. A study of evolution as a basic concept of the biological sciences; an examination of current methods of experimentation within the area, as well as evidences for the possible mechanisms of evolutionary change. Typically offered Spring.

BIOL 53300 - Medical Microbiology

Credit Hours: 3.00. Host-parasite relationships. Immunology. Bacteria and viruses associated with infectious diseases. Typically offered Fall.

CNIT 42000 - Basic Cyber Forensics

Credit Hours: 3.00. This course introduces students to the fundamentals of cyber forensics and cyber-crime scene analysis. The various laws and regulations dealing with computer forensic analysis are discussed. Students are introduced to the emerging international standards for cyber forensic analysis, as well as a formal methodology for conducting computer forensic investigations. Typically offered Summer Fall Spring.

CNIT 45500 - Network Security

Credit Hours: 3.00. This course explores business, conceptual, and technological aspects of network security for voice and data networks. The course deals with the analysis, design, implementation, and management issues surrounding effective network security. Key concepts and technology include virus protection, firewalls, authentication, encryption, wireless security, security protocols, physical security, and network security architecture and policy development. Typically offered Fall Spring Summer.

CNIT 45600 - Wireless Security And Management

Credit Hours: 3.00. This course is an advanced course concerning security and management issues as they apply to wireless

networking. Students will gain knowledge on the problems and solutions the wireless industry face when implementing large scale networks. Issues addressed include encryption weaknesses, security methodology tradeoffs, large scale network management techniques and systems, and advanced wireless network architecture. The laboratory portion of the course enforces the learning outcomes with hands-on experiences in implementing secure, manageable complex wireless networks. Typically offered Summer Fall Spring.

CNIT 51100 - Foundations In Homeland Security Studies

Credit Hours: 3.00. An interdisciplinary course addressing prevention, mitigation, preparation, response, and recovery from catastrophic events that threaten private and public sector resources and infrastructures. Course contents will include: characteristics of security; personal/corporate perspectives; identification of assets; assessing cost/benefits of protecting assets; risk assessment and risk management; crisis decision making; emergency management resources and response infrastructures; best practices in emergency management and risk and crisis communication; business continuity; and the importance of a collaborative response. Case studies include the 9-11 attacks and Hurricane Katrina. External experts will present and career opportunities will be discussed. Permission of instructor required. Typically offered Fall.

CNIT 51200 - Managing Resources And Applications For Homeland Security

Credit Hours: 3.00. An interdisciplinary course providing examples and practice in applying and managing the resources, including technologies, used in the private and public sectors for homeland security programs. Course contents will include: terrorism; corporate security; biosecurity; health care preparedness; personal/community preparedness; risk transfer; and information security and privacy. Additional content includes discussion of local, state, and federal preparedness programs issues in the public/private sectors that are designed to ensure survival during a continuum of emergency events, and continued practice in using collaborative application of team building skills. Permission of instructor required. Typically offered Spring.

CNIT 55700 - Advanced Research Topics In Cyber Forensics

Credit Hours: 3.00. Provides students at the advanced degree level the opportunity to expand their knowledge of cyber forensics. Students are expected to have fundamental understanding of cyber forensics and digital forensic science. The emphasis is on directed learning and scholarly inquiry. Possible research topics range from law and public policy to software and/or hardware development. Permission of instructor required. Typically offered Summer Fall Spring.

CHM 22400 - Introductory Quantitative Analysis

Credit Hours: 4.00. Introduction to titrimetric, gravimetric, and instrumental methods of analysis; principles of separation processes, including chromatography; recognition and evaluation of possible sources of error. Required of students majoring in biology who do not take CHM 32100. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for

biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

ENTM 21000 - Introduction To Insect Behavior

Credit Hours: 3.00. Description and introductory analysis of innate and learned insect behavior, including basic orientations and movements, behavioral periodicity, communication, chemical and structural defenses, host selection and feeding, reproduction, and insect societies. General biology and introductory entomology are desirable, but not essential. Typically offered Spring.

ENTM 33500 - Introduction To Insect Identification

Credit Hours: 4.00. This class is designed for learning more about the collection and identification of adult insects. Emphasis will be placed on collection and sampling techniques, the preparation of specimens for future study, and identification. Typically offered Fall.

ENTM 50600 - Advanced Insect Taxonomy

Credit Hours: 4.00. Classification and relationship of insects and related Arthropoda. Introduction to systematic principles. Survey of North American fauna, with emphasis on family identification of adults. Knowledge of college-level entomology is strongly recommended. Offered in even-numbered years. Typically offered Fall.

ENTM 51000 - Insect Pest Management

Credit Hours: 3.00. Concepts of pest management and dynamics of pest populations, with emphasis on population regulation in theory and practice. The principles of applied ecology that pertain to insects and agricultural crops and systems. Identification, biology, behavior, and relationships of pests of forage, fiber, and vegetable crops. A knowledge of introductory entomology is recommended. Offered in even-numbered years. Typically offered Fall.

ENTM 52500 - Medical And Veterinary Entomology

Credit Hours: 3.00. Introduction to the biology and control of arthropods of medical and veterinary importance, and coverage of the natural history and abatement of selected arthropod-related diseases, including arboviral encephalitis, filariasis, leishmaniasis, Lyme disease, malaria, plague, spotted fever, trypanosomiasis, and myasis. Offered in odd-numbered years. Typically offered Spring.

ENTM 52600 - Urban And Industrial Vertebrate Management

Credit Hours: 3.00. Principles and practices of vertebrate pest management in urban and industrial environments, with emphasis on the impact of these pests on our health, food supplies and property, diagnosis of pest problems, pest biology and behavior, practical implementation of management strategies, future directions and opportunities, and analysis of advances in pest vertebrate management. Course offered in odd-numbered years. Typically offered Spring.

ENTM 55100 - Insect Physiology And Biochemistry

Credit Hours: 3.00. Basic physiology and biochemistry of insects covering development, functions of internal systems, and interactions of insects with their environments. An introductory course in entomology, or familiarity with insects, and concurrent enrollment in a biochemistry course is recommended. Offered in even-numbered years. Typically offered Spring.

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 34100 - Wildlife Habitat Management

Credit Hours: 3.00. Principles, practices, and justification of the habitat management approach to the manipulation of wildlife populations. Typically offered Spring.

HSCI 33300 - Introduction To Immunology

Credit Hours: 2.00. An introduction to the various aspects of the immune system. Students will become familiar with components of the immune system and their interactions. Emphasis on clinical applications. Various diseases will be discussed as they relate to the immune system. Typically offered Spring.

HSCI 56000 - Toxicology

Credit Hours: 3.00. (MCMP 56000) Introduction to general principles of toxicology, target organ toxicity, and safety evaluation. Covers toxicity of metals, solvents, pesticides, gases, dusts, and food additives. Typically offered Fall.

PHYS 17200 - Modern Mechanics

Credit Hours: 4.00. Introductory calculus-based physics course using fundamental interactions between atoms to describe Newtonian mechanics, conservation laws, energy quantization, entropy, the kinetic theory of gases, and related topics in mechanics and thermodynamics. Emphasis is on using only a few fundamental principles to describe physical phenomena extending from nuclei to galaxies. 3-D graphical simulations and numerical problem solving by computer are employed by the student from the very beginning. Typically offered Summer Fall Spring. CTL:IPS 1753 Calculus-based Physics I

PHYS 21800 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, primarily for technology students. Typically offered Summer Fall Spring.

PHYS 21900 - General Physics II

Credit Hours: 4.00. Electricity, light, and modern physics, primarily for technology students. Typically offered Summer Fall Spring.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

PHYS 22100 - General Physics

Credit Hours: 4.00. Electricity, light, and modern physics, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1752 Algebra-based Physics II

POL 42500 - Environmental Law And Politics

Credit Hours: 3.00. This course provides an introduction to statutory and case law relating to environmental policy. Regulatory schemes in environmental policy and the legal framework for environmental regulation are presented. Market alternatives to various regulatory mechanisms will also be treated. Typically offered Summer Fall Spring.

POL 42800 - The Politics Of Regulation

Credit Hours: 3.00. Politics and policies of federal and state regulatory agencies. Explanations of regulatory agency behavior, arguments for and against government regulation, and alternatives to government regulation. Typically offered Fall Spring Summer.

PSY 33500 - Stereotyping And Prejudice

Credit Hours: 3.00. This course examines the topics of stereotyping, prejudice, and discrimination from a social psychological perspective. Relying on empirical findings and relevant theoretical approaches, the course moves beyond lay opinions to explore the social psychological foundations and forms of stereotyping and prejudice, and to examine various strategies for reducing intergroup biases. Typically offered Fall Spring.

PSY 42800 - Drugs And Behavior

Credit Hours: 3.00. Discussion of the variety of drugs that affect the nervous system and behavior. Emphasis will be upon a discussion of the physiological and pharmacological bases for the use and misuse of drugs in our society. Typically offered Fall Spring.

PSY 44300 - Aggression And Violence

Credit Hours: 3.00. An intensive examination of the nature of human aggression. Among the topics covered will be (1) theoretical perspectives concerning such behavior; (2) social conditions that encourage its performance; and (3) means for its prevention and control. Typically offered Fall Spring.

PSY 35000 - Abnormal Psychology

Credit Hours: 3.00. Various forms of mental disorders from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment. Typically offered Fall Spring Summer. CTL:ISH 1023 Abnormal Psychology

PSY 53500 - Psychology Of Death And Dying

Credit Hours: 3.00. An examination of psychological research and theory related to death and the dying process. Topics include death concepts, attitudes, and fears, psychosocial predictors of death, effects of death on survivors, psycho-social factors related

to individual differences and normative dying behaviors, stages of dying, effects of pain and drugs, and managing the dying process. Typically offered Spring.

SOC 32400 - Criminology

Credit Hours: 3.00. (CRJU 32400) Nature and cause of crime; methods of dealing with adult and juvenile offenders, consideration of present programs for the social treatment of crime in the light of needed changes. Typically offered Fall Spring Summer.

SOC 32700 - Crime, Deviance And Mass Media

Credit Hours: 3.00. Various forms of mass media are used to explore the sociology of crime and deviance. Topics may include white collar crime, juvenile delinquency, street crime, sexuality and sexual orientation, hate crimes, deviance and community. Assignments include quizzes and short papers. Typically offered Fall, Spring.

SOC 32800 - Criminal Justice

Credit Hours: 3.00. Introduction to institutionalized responses of society to the problem of crime. Analysis of the administration of justice in each of the major components of the criminal justice system and laws regulating their operations. Some consideration given to comparative criminal justice. Typically offered Fall Spring. CTL:ISH 1030 Introduction To Criminal Justice

SOC 35600 - Hate And Violence

Credit Hours: 3.00. Examines the causes of and solutions to hatred and violence. Concepts such as anti-Semitism, discrimination, hate crimes, prejudice, racism, bullying, homosexual prejudice, terrorism and other topics will be addressed. This course uses experiential activities, videos, guest speakers and classroom discussion. Typically offered Fall Spring.

SOC 41900 - Sociology Of Law

Credit Hours: 3.00. Provides an overview of American legal thought and legal processes. Major topics include definitions of law; anthropological studies of law; origin and development of law; jurisprudence; police behavior; lawyers and courts; deterrent and labeling effects of legal sanctions. Typically offered Fall Spring.

SOC 42600 - Social Deviance And Control

Credit Hours: 3.00. Sociological and social psychological study of social control and social deviance. Emphasis on theoretical frameworks and empirical research. Consideration also given to specific areas such as substance abuse, suicide, violence, and deviant collective behavior. Typically offered Fall.

SOC 45400 - Family Violence

Credit Hours: 3.00. Child abuse, intimate partner violence, and elder abuse are examined with a focus on correlates, treatments and prevention strategies. Definitions of family violence and the social contexts related to family violence are assessed. Legal and medical models to explain family violence are compared. Typically offered Summer Fall Spring.

Notes

Departmental permission is not required to enroll in this minor.

Department of Food Science

Overview

The Department of Food Science at Purdue University is committed to impacting the world food system and quality of life by educating and training undergraduate and graduate students for careers in industry, government, and academia. Our mission is to expand and transfer knowledge for continuous improvement of the safety, quality, value, and security of the world's food supply through basic research and outreach programs. Our faculty, staff, and students are located on Purdue University's main campus in the **Philip E. Nelson Hall of Food Science, 745 Agriculture Mall Drive, West Lafayette, Indiana 47907**. This building provides excellent research laboratories, as well as specialized facilities such as the sensory evaluation laboratory, pilot scale-manufacturing plant, student product development and innovation laboratory, and enology library for us to engage with the food and beverage industry and government partners.

Faculty

https://ag.purdue.edu/foodsci/Pages/directory.aspx

Contact Information

Department of Food Science

Purdue University

Nelson Hall of Food Science
745 Agriculture Mall Drive
West Lafayette, IN 47907
Phone: (765) 494-2766

Email: foodsci@purdue.edu

Website:http://ag.purdue.edu/foodsci

The Main office for the department is located in Room 2211 of the NLSN Building.

Graduate Information

For Graduate Information please see Food Sciences Graduate Program Information.

Food Science, BS

About the Program

The field of Food Science applies science, such as microbiology and biochemistry, to discover ways to improve the taste, nutrition, and value of the food supply. A food scientist possesses the skills necessary to convert raw food products into safe, attractive foods and beverages. Graduates apply scientific knowledge and economic principles to food production, storage, distribution, product development, quality control, inspection, and sales, or they, pursue graduate studies in food processing, microbiology, or chemistry.

Food Science Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Food Science include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (108 credits)

Required Major Courses (34 credits)

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

FS 24500 - Food Packaging

Credit Hours: 1.00. Elements of packaging science and technology applied to preservation, distribution, and marketing of food

products; packaging materials; principles of diffusion and permeability; procedures for developing, evaluating, and testing food packages; packaging requirements for specific types of foods; other special topics of current interest. Typically offered Spring.

FS 29800 - Sophomore Seminar

Credit Hours: 1.00. Current food science issues will be discussed by students, staff, and guest speakers. Career planning and improvement of communication skills will be emphasized. Typically offered Fall.

FS 34000 - Introduction To Food Law And Regulations

Credit Hours: 1.00. This course will cover basic knowledge and familiarity of the principal law and regulations governing raw and processed foods. Class meets during weeks 1-5. . Typically offered Spring.

FS 34100 - Food Processing I

Credit Hours: 2.00. Applications of the fundamentals of food engineering, microbiology, and chemistry to methods of food processing and preservation; emphasis will be on processing concepts, preparation for food processing, food formulation, and thermal processing. Typically offered Fall.

FS 34200 - Food Processing I Laboratory

Credit Hours: 1.00. This laboratory course applies food engineering principles and thermal processing methods for production of safe and high quality foods. The course will include applications of mathematics and physics principles in food processing operations, engineering problem solving exercises and laboratory demonstrations. Engineering concepts such as heat transfer, fluid flow, mass and energy balances applied to various food systems will be a major portion of this laboratory. Typically offered Fall.

FS 36100 - Food Plant Sanitation

Credit Hours: 1.00. Relation of food-plant sanitation to good manufacturing practices and regulations affecting sanitation; organization of a food-plant sanitation program; sanitary building and equipment construction; selection of cleaning, sanitizing, and pesticidal compounds; water, air, and waste treatment; food storage and transportation. Typically offered Fall.

FS 36200 - Food Microbiology

Credit Hours: 3.00. Microbiology of foods, with emphasis on the conditions for growth of microorganisms and degradation of food components, preservation methods, use of Hazard Analysis and Critical Control Point (HACCP) concepts, and microorganisms associated with foodborne illness, and modern detection methods. Typically offered Fall.

FS 36300 - Food Microbiology Laboratory

Credit Hours: 2.00. Classic and molecular methods for enumerating, isolating, and identifying spoilage, fermentative, and pathogenic food microorganisms in food systems. Typically offered Fall.

FS 43500 - Sensory Science

Credit Hours: 1.00. Introduction to the fundamental concepts and practices of sensory analysis of food products. Technical aspects of planning and conducting human sensory panels on food products including analysis and interpretation of collected data. Course meets weeks 1-8. Typically offered Spring.

FS 44200 - Food Processing II

Credit Hours: 2.00. Study of food processing and preservation methods based on the integrated knowledge of microbiology, chemistry, and food engineering; emphasis will be on temperature reduction, water activity, concentration, dehydration, irradiation, and extrusion. Typically offered Fall.

FS 44700 - Food Processing II Laboratory

Credit Hours: 1.00. This lab is designed to build upon fundamental concepts associated with the preservation and processing of various food products. Concepts to be covered include water activity, dehydration (drum, spray and freeze drying), frying, high pressure, microwave and ohmic heating. The focus of this lab will be hands-on production of various food products and the demonstration of fundamental food processing unit operations and calculations related to each preservation method. Typically offered Fall.

FS 44400 - Statistical Process Control

Credit Hours: 1.00. Basic concepts and techniques of solving quality problems and assuring the quality of production processes; emphasis is on quality improvement programs, problem-solving tools, control charts for variables and attributes, process capability analysis, and sampling methods. Course meets during weeks 6-10. Typically offered Fall.

FS 45300 - Food Chemistry

Credit Hours: 3.00. Application of fundamental laws and concepts of chemistry, physics, and biology to the properties, composition, and storage of foods. Typically offered Spring.

FS 45400 - Food Chemistry Laboratory

Credit Hours: 1.00. Laboratory to demonstrate application of fundamental laws and concepts of chemistry, physics, and biology to the properties, composition, and storage of foods. Typically offered Spring.

FS 46700 - Food Analysis

Credit Hours: 3.00. Application of quantitative and qualitative physical, chemical, and instrumental methods of analysis to the examination of food products; evaluation of methods for specific applications. Typically offered Spring.

FS 46900 - Food Analysis Laboratory

Credit Hours: 2.00. Practical laboratory applications of food analysis, including relevant calculations using data gathered and interpretation of data. (Intended for upper-division students.) Typically offered Spring.

FS 48200 - Food Science Senior Seminar

Credit Hours: 1.00. Oral and written reports on selected food science topics. Typically offered Fall.

FS 53000 - Food Ingredient Technology

Credit Hours: 1.00. Identifies functions of ingredients listed on ingredient labels of food products and discusses alternative ingredient choices for food products. Typically offered Spring.

FS 44300 - Food Product Design (Capstone)

Credit Hours: 3.00. Teams develop a new product from concept through marketing. Final case study defense is presented to faculty and peers. Classes include guest lectures from the food industry. Typically offered Spring.

Other Departmental /Program Course Requirements (74 credits)

(See Advising Resources)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11800 - Introduction To Food Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Food Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

NUTR 31500 - Fundamentals Of Nutrition

Credit Hours: 3.00. Basic principles of nutrition and their application in meeting nutritional needs during the life cycle. Typically offered Fall Spring.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Professional Communications Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (12 credits)

- Elective - Credit Hours: 12.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

Requirements

Minimum GPA of 2.50 in FS core classes and NUTR 31500 is required for graduation

Students must meet a minimum GPA ≥ 2.50 in math and science courses to enroll in upper division FS courses.

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11800 - Introduction To Food Science Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Food Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

15 Credits

Fall 2nd Year

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

FS 29800 - Sophomore Seminar

Credit Hours: 1.00. Current food science issues will be discussed by students, staff, and guest speakers. Career planning and improvement of communication skills will be emphasized. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

16 Credits

Spring 2nd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

FS 24500 - Food Packaging

Credit Hours: 1.00. Elements of packaging science and technology applied to preservation, distribution, and marketing of food products; packaging materials; principles of diffusion and permeability; procedures for developing, evaluating, and testing food packages; packaging requirements for specific types of foods; other special topics of current interest. Typically offered Spring.

PHYS 22000 - General Physics

Credit Hours: 4.00. Mechanics, heat, and sound, for students not specializing in physics. Typically offered Fall Spring Summer. CTL:IPS 1751 Algebra-based Physics I

- Economics Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

FS 34100 - Food Processing I

Credit Hours: 2.00. Applications of the fundamentals of food engineering, microbiology, and chemistry to methods of food

processing and preservation; emphasis will be on processing concepts, preparation for food processing, food formulation, and thermal processing. Typically offered Fall.

FS 34200 - Food Processing I Laboratory

Credit Hours: 1.00. This laboratory course applies food engineering principles and thermal processing methods for production of safe and high quality foods. The course will include applications of mathematics and physics principles in food processing operations, engineering problem solving exercises and laboratory demonstrations. Engineering concepts such as heat transfer, fluid flow, mass and energy balances applied to various food systems will be a major portion of this laboratory. Typically offered Fall.

FS 36100 - Food Plant Sanitation

Credit Hours: 1.00. Relation of food-plant sanitation to good manufacturing practices and regulations affecting sanitation; organization of a food-plant sanitation program; sanitary building and equipment construction; selection of cleaning, sanitizing, and pesticidal compounds; water, air, and waste treatment; food storage and transportation. Typically offered Fall.

FS 36200 - Food Microbiology

Credit Hours: 3.00. Microbiology of foods, with emphasis on the conditions for growth of microorganisms and degradation of food components, preservation methods, use of Hazard Analysis and Critical Control Point (HACCP) concepts, and microorganisms associated with foodborne illness, and modern detection methods. Typically offered Fall.

FS 36300 - Food Microbiology Laboratory

Credit Hours: 2.00. Classic and molecular methods for enumerating, isolating, and identifying spoilage, fermentative, and pathogenic food microorganisms in food systems. Typically offered Fall.

NUTR 31500 - Fundamentals Of Nutrition

Credit Hours: 3.00. Basic principles of nutrition and their application in meeting nutritional needs during the life cycle. Typically offered Fall Spring.

- UCC Humanities Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

18 Credits

Spring 3rd Year

FS 45300 - Food Chemistry

Credit Hours: 3.00. Application of fundamental laws and concepts of chemistry, physics, and biology to the properties, composition, and storage of foods. Typically offered Spring.

FS 45400 - Food Chemistry Laboratory

Credit Hours: 1.00. Laboratory to demonstrate application of fundamental laws and concepts of chemistry, physics, and biology to the properties, composition, and storage of foods. Typically offered Spring.

FS 46700 - Food Analysis

Credit Hours: 3.00. Application of quantitative and qualitative physical, chemical, and instrumental methods of analysis to the examination of food products; evaluation of methods for specific applications. Typically offered Spring.

FS 46900 - Food Analysis Laboratory

Credit Hours: 2.00. Practical laboratory applications of food analysis, including relevant calculations using data gathered and interpretation of data. (Intended for upper-division students.) Typically offered Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

FS 44200 - Food Processing II

Credit Hours: 2.00. Study of food processing and preservation methods based on the integrated knowledge of microbiology, chemistry, and food engineering; emphasis will be on temperature reduction, water activity, concentration, dehydration, irradiation, and extrusion. Typically offered Fall.

FS 44400 - Statistical Process Control

Credit Hours: 1.00. Basic concepts and techniques of solving quality problems and assuring the quality of production processes;

emphasis is on quality improvement programs, problem-solving tools, control charts for variables and attributes, process capability analysis, and sampling methods. Course meets during weeks 6-10. Typically offered Fall.

FS 44700 - Food Processing II Laboratory

Credit Hours: 1.00. This lab is designed to build upon fundamental concepts associated with the preservation and processing of various food products. Concepts to be covered include water activity, dehydration (drum, spray and freeze drying), frying, high pressure, microwave and ohmic heating. The focus of this lab will be hands-on production of various food products and the demonstration of fundamental food processing unit operations and calculations related to each preservation method. Typically offered Fall.

FS 48200 - Food Science Senior Seminar

Credit Hours: 1.00. Oral and written reports on selected food science topics. Typically offered Fall.

FS 53000 - Food Ingredient Technology

Credit Hours: 1.00. Identifies functions of ingredients listed on ingredient labels of food products and discusses alternative ingredient choices for food products. Typically offered Spring.

- Professional Communication Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00

12 Credits

Spring 4th Year

FS 34000 - Introduction To Food Law And Regulations

Credit Hours: 1.00. This course will cover basic knowledge and familiarity of the principal law and regulations governing raw and processed foods. Class meets during weeks 1-5. . Typically offered Spring.

FS 43500 - Sensory Science

Credit Hours: 1.00. Introduction to the fundamental concepts and practices of sensory analysis of food products. Technical aspects of planning and conducting human sensory panels on food products including analysis and interpretation of collected data. Course meets weeks 1-8. Typically offered Spring.

FS 44300 - Food Product Design (Capstone)

Credit Hours: 3.00. Teams develop a new product from concept through marketing. Final case study defense is presented to faculty and peers. Classes include guest lectures from the food industry. Typically offered Spring.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective (30000+) - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Minimum GPA of 2.50 in FS core classes and NUTR 31500 is required for graduation

Students must meet a minimum GPA ≥ 2.50 in math and science courses to enroll in upper division FS courses.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Food Science Minor

18 credits

Required Courses

(11 credits)

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

FS 34100 - Food Processing I

Credit Hours: 2.00. Applications of the fundamentals of food engineering, microbiology, and chemistry to methods of food processing and preservation; emphasis will be on processing concepts, preparation for food processing, food formulation, and thermal processing. Typically offered Fall.

FS 36200 - Food Microbiology

Credit Hours: 3.00. Microbiology of foods, with emphasis on the conditions for growth of microorganisms and degradation of food components, preservation methods, use of Hazard Analysis and Critical Control Point (HACCP) concepts, and microorganisms associated with foodborne illness, and modern detection methods. Typically offered Fall.

FS 45300 - Food Chemistry

Credit Hours: 3.00. Application of fundamental laws and concepts of chemistry, physics, and biology to the properties, composition, and storage of foods. Typically offered Spring.

Selectives

(7 credits from the following)

ANSC 35100 - Meat Science

Credit Hours: 3.00. Study of muscle and meat, principles involved in the conversion of living animals to meat and by-products; efficient utilization of all types of meat as food. Typically offered Spring.

ANSC 35101 - Meat Science Laboratory

Credit Hours: 1.00. Application of scientific principles to the meat industry, with emphasis on all aspects of processing including: harvest; carcass grading and evaluation; fabrication; cured, smoked, and comminuted meat products; quality control; product development; and retail and food service merchandising. Typically offered Spring.

NUTR 31500 - Fundamentals Of Nutrition

Credit Hours: 3.00. Basic principles of nutrition and their application in meeting nutritional needs during the life cycle. Typically offered Fall Spring.

- FS 10000-59999* - All Food Sciences courses - Credit Hours: 3.00

Notes

Department permission is not required to enroll in this minor.

* Maximum of 3 credits of independent study (FS 29100 or FS 49100).

Pet Food Processing Minor

21 credits

Required Courses

(21 credits)

ANSC 10600 - Biology Companion Animal

Credit Hours: 3.00. Introduction to the various aspects of companion animal biology. Topics include anatomy, physiology, health, immunity, nutrition, growth, digestion, metabolism, behavior, genetics, reproduction and lactation. Typically offered Spring.

ANSC 32400 - Applied Animal Nutrition

Credit Hours: 3.00. Application of the principles of animal nutrition to the formulation and feeding of supplements and complete rations for animals; ration ingredients and substitution values; computer applications; legal aspects of feed formulation; and industry practices. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

ANSC 44600 - Companion Animal Management

Credit Hours: 3.00. This course details understanding of the economic scope of the pet industry as well as the role of pets in American society. The students will acquire the information to be responsible pet owners by experiencing their knowledge of housing practices, nutritional care, health care, behavior and breeding of companion animals. Typically offered Fall.

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship;

government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

FS 34100 - Food Processing I

Credit Hours: 2.00. Applications of the fundamentals of food engineering, microbiology, and chemistry to methods of food processing and preservation; emphasis will be on processing concepts, preparation for food processing, food formulation, and thermal processing. Typically offered Fall.

FS 34200 - Food Processing I Laboratory

Credit Hours: 1.00. This laboratory course applies food engineering principles and thermal processing methods for production of safe and high quality foods. The course will include applications of mathematics and physics principles in food processing operations, engineering problem solving exercises and laboratory demonstrations. Engineering concepts such as heat transfer, fluid flow, mass and energy balances applied to various food systems will be a major portion of this laboratory. Typically offered Fall.

FS 44200 - Food Processing II

Credit Hours: 2.00. Study of food processing and preservation methods based on the integrated knowledge of microbiology, chemistry, and food engineering; emphasis will be on temperature reduction, water activity, concentration, dehydration, irradiation, and extrusion. Typically offered Fall.

FS 44700 - Food Processing II Laboratory

Credit Hours: 1.00. This lab is designed to build upon fundamental concepts associated with the preservation and processing of various food products. Concepts to be covered include water activity, dehydration (drum, spray and freeze drying), frying, high pressure, microwave and ohmic heating. The focus of this lab will be hands-on production of various food products and the demonstration of fundamental food processing unit operations and calculations related to each preservation method. Typically offered Fall.

FS 36200 - Food Microbiology

Credit Hours: 3.00. Microbiology of foods, with emphasis on the conditions for growth of microorganisms and degradation of food components, preservation methods, use of Hazard Analysis and Critical Control Point (HACCP) concepts, and microorganisms associated with foodborne illness, and modern detection methods. Typically offered Fall.

Notes

Department permission is not required to enroll in this minor.

* (3) ANSC 10200 (Introduction to Animal Agriculture) can be substituted for ANSC 10600, but ANSC 10600 is preferred for this minor.

Department of Forestry and Natural Resources

Overview

Welcome to the Department of Forestry and Natural Resources (FNR)! As one of the nation's elite programs in ecology and evolutionary biology, it is our mission to develop and disseminate knowledge associated with the protection, management, and sustainable use of terrestrial and aquatic ecosystems. FNR is training the next generation of professionals in the natural resource sciences, which includes fisheries and aquatic sciences, forestry, wildlife and sustainable biomaterials: process and product design.

Faculty

https://ag.purdue.edu/fnr/Pages/directory.aspx

Contact Information

The Department of Forestry and Natural Resources

Purdue University

Pfendler Hall
715 West State Street
West Lafayette IN 47907-2061

Phone: 765-494-3591

Email: joinfnr@purdue.edu

Website: ag.purdue.edu/fnr

The Main office for the department is located in Room G-003 in PFEN Hall.

Graduate Information

For Graduate Information please see Forestry and Natural Resources Graduate Program Information.

Fisheries and Aquatic Sciences, BS

About the Program

Prepare for a career in fisheries research and management, lake and stream management, aquaculture, and interdisciplinary studies of environmental problems. Studies emphasize understanding ecosystems function, natural and human disturbance, and ecosystem resilience. You are preparing for work in public organizations (state/federal fish and wildlife), not-for-profit organizations (Nature Conservancy), private consulting firms, or for graduate studies (MS, PhD, DVM). This degree meets the educational requirements for the American Fisheries Society's Professional Certification.

Fisheries and Aquatic Sciences Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Fisheries and Aquatic Sciences include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (110 credits)

Required Major Courses (53 credits)

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

FNR 20100 - Marine Biology

Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural

resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

FNR 25150 - Ecology And Systematics Of Mammals And Birds

Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.

FNR 25250 - Laboratory In Ecology And Systematics Of Mammals And Birds

Credit Hours: 1.00. Basic anatomy, classification, and identification of mammals and birds. Identification deals with representative species from selected phylogenetic and geographic groupings in North America. Typically offered Spring.

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 35100 - Aquatic Sampling Techniques

Credit Hours: 3.00. An introduction to laboratory and field sampling methods in aquaculture, limnology, and fisheries biology. Emphasis will be placed on the proper use of laboratory equipment and sampling gears, as well as the development of sampling protocols for collecting representative, non-biased fisheries and aquatic sciences data. Typically offered Spring.

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37100 - Fisheries And Aquatic Sciences Practicum

Credit Hours: 5.00. Specific field instruction in fisheries and aquatic sciences. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 40800 - Natural Resources Planning

Credit Hours: 3.00. Management concepts and decision making emphasizing formal planning processes including development of objectives, analysis of alternatives, and decision making within the constraints of changing social and political trends, economic feasibility, and sustainability of ecosystem functions for a property. Laboratory activities are focused on the development of a management plan by an interdisciplinary team for a specific area and set of objectives. Typically offered Spring.

FNR 45200 - Aquaculture

Credit Hours: 3.00. Historical perspectives and current practices in aquaculture, including production systems, feeds, water quality requirements, and diseases of commercially important species. Typically offered Spring.

FNR 45300 - Fish Physiology

Credit Hours: 3.00. Presentation and discussion of physiological mechanisms exhibited by freshwater and marine invertebrates and vertebrates. Primary materials used for class presentation and discussions will be examples from primary research literature. Topics include respiration, osmoregulation, stress physiology, absorption and metabolism of compounds, and hormonal control of selected physiological mechanisms. Offered in odd-numbered years. Typically offered Spring.

FNR 45500 - Fish Ecology

Credit Hours: 3.00. The relationship of fishes to the physical, chemical, and biological features of the environment in both natural and perturbed aquatic ecosystems. An emphasis will be placed on diversity in morphology, behavior, feeding, and reproductive strategies as they relate to individual and population adaptation, community structure, and anthropogenic effects. Offered in even-numbered years. Typically offered Spring.

FNR 45400 - Fisheries Science And Management

Credit Hours: 3.00. Theory and practice of fisheries management, with emphasis on strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, sport and commerical fish populations, and human resource users and non-users are considered as in the setting of appropriate goals and objectives for effective, science-based management. One weekend field laboratory is required. Typically offered Fall.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

FNR 52600 - Aquatic Animal Health

Credit Hours: 2.00. This is an introductory course designed to provide instruction on the methodology of diagnosis and treatment of parasitic, fungal, bacterial, viral, nutritional, and environmental diseases of fishes and other aquatic organisms (amphibians, reptiles, and bivalves). Courses in chemistry and biology are expected and in animal physiology is preferred, but not required. Typically offered Fall.

FNR 52700 - Ecotoxicology

Credit Hours: 2.00. This course covers theoretical and applied approaches to the science of ecotoxicology, including application of the tools and procedures used to understand toxicant fate and effects in free-ranging animals and ecosystems. Students are expected to be knowledgeable in chemistry, biology, and animal physiology. Typically offered Fall.

Major Selectives (6 credits)

- FNR Physcal science selective - Credit Hours: 3.00
- FNR Physcal science selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (51 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices;

nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- FNR Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Ethics Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (10 credits)

- Elective - Credit Hours: 10.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

FNR 20100 - Marine Biology

Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- FNR Economics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 25150 - Ecology And Systematics Of Mammals And Birds

Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.

FNR 25250 - Laboratory In Ecology And Systematics Of Mammals And Birds

Credit Hours: 1.00. Basic anatomy, classification, and identification of mammals and birds. Identification deals with representative species from selected phylogenetic and geographic groupings in North America. Typically offered Spring.

FNR 35100 - Aquatic Sampling Techniques

Credit Hours: 3.00. An introduction to laboratory and field sampling methods in aquaculture, limnology, and fisheries biology. Emphasis will be placed on the proper use of laboratory equipment and sampling gears, as well as the development of sampling protocols for collecting representative, non-biased fisheries and aquatic sciences data. Typically offered Spring.

15 Credits

Summer Session

FNR 37100 - Fisheries And Aquatic Sciences Practicum

Credit Hours: 5.00. Specific field instruction in fisheries and aquatic sciences. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

6 Credits

Fall 3rd Year

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 45400 - Fisheries Science And Management

Credit Hours: 3.00. Theory and practice of fisheries management, with emphasis on strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, sport and commerical fish populations, and human resource users and non-users are considered as in the setting of

appropriate goals and objectives for effective, science-based management. One weekend field laboratory is required. Typically offered Fall.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00

12 Credits

Spring 3rd Year

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 45500 - Fish Ecology

Credit Hours: 3.00. The relationship of fishes to the physical, chemical, and biological features of the environment in both natural

and perturbed aquatic ecosystems. An emphasis will be placed on diversity in morphology, behavior, feeding, and reproductive strategies as they relate to individual and population adaptation, community structure, and anthropogenic effects. Offered in even-numbered years. Typically offered Spring.

FNR 45300 - Fish Physiology

Credit Hours: 3.00. Presentation and discussion of physiological mechanisms exhibited by freshwater and marine invertebrates and vertebrates. Primary materials used for class presentation and discussions will be examples from primary research literature. Topics include respiration, osmoregulation, stress physiology, absorption and metabolism of compounds, and hormonal control of selected physiological mechanisms. Offered in odd-numbered years. Typically offered Spring.

- Physical Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

FNR 52600 - Aquatic Animal Health

Credit Hours: 2.00. This is an introductory course designed to provide instruction on the methodology of diagnosis and treatment of parasitic, fungal, bacterial, viral, nutritional, and environmental diseases of fishes and other aquatic organisms (amphibians, reptiles, and bivalves). Courses in chemistry and biology are expected and in animal physiology is preferred, but not required. Typically offered Fall.

FNR 52700 - Ecotoxicology

Credit Hours: 2.00. This course covers theoretical and applied approaches to the science of ecotoxicology, including application of the tools and procedures used to understand toxicant fate and effects in free-ranging animals and ecosystems. Students are expected to be knowledgeable in chemistry, biology, and animal physiology. Typically offered Fall.

- Ethics Selective - Credit Hours: 3.00
- FNR Physical Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits

Spring 4th Year

FNR 40800 - Natural Resources Planning

Credit Hours: 3.00. Management concepts and decision making emphasizing formal planning processes including development of objectives, analysis of alternatives, and decision making within the constraints of changing social and political trends, economic feasibility, and sustainability of ecosystem functions for a property. Laboratory activities are focused on the development of a management plan by an interdisciplinary team for a specific area and set of objectives. Typically offered Spring.

FNR 45200 - Aquaculture

Credit Hours: 3.00. Historical perspectives and current practices in aquaculture, including production systems, feeds, water quality requirements, and diseases of commercially important species. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Official and complete prerequisite lists are in the course catalog; the incomplete listing presented here regards this program and course sequencing.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Forestry, BSFOR

About the Program

Learn to apply biological, ecological, economic, and social knowledge as you develop and implement sustainable forest management plans. Studies emphasize understanding ecosystems function, natural and human disturbance, and ecosystem resilience. This prepares you for careers with public agencies such as state divisions of forestry, U.S. Forest Service or private industries and consulting firms. This program is accredited by the Society of American Foresters.

Forestry Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Forestry include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

124 credits required for graduation

Departmental/Program Major Courses (116 credits)

Required Major Courses (52 credits)

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

FNR 33100 - Forest Ecosystems

Credit Hours: 3.00. Introduction to ecosystem processes, with emphasis on structural dynamics, energy flows, nutrient cycling, spatial patterns, classification and interaction of plant and animal populations. Processes will be related to human activities. Typically offered Fall.

FNR 33900 - Principles Of Silviculture

Credit Hours: 3.00. Silviculture systems; establishment of stands; control of stand composition, growth, and quality. Typically offered Fall.

FNR 35300 - Natural Resources Measurement

Credit Hours: 3.00. An introduction to sampling techniques and fundamental principles for measuring natural resources. Typically offered Spring.

FNR 35500 - Quantitative Methods For Resource Management

Credit Hours: 3.00. Application of analytical and computational techniques for the purpose of making decisions regarding the management of forests. Typically offered Spring.

FNR 35700 - Fundamental Remote Sensing

Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37050 - Forest Habitats And Communities Practicum

Credit Hours: 1.00. Specific field instruction in forestry and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37200 - Forestry Practicum

Credit Hours: 4.00. Specific field instruction in forestry. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural

resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 40700 - Forest Economics

Credit Hours: 3.00. Implications of unique economic characteristics of forest resources, including a tree as both capital and output, high capital to output ratio, location utility of in-forest uses, long investment periods, and non-market outputs. Typically offered Spring.

FNR 40910 - Forest Resources Management

Credit Hours: 3.00. Forest Resources Management focuses on the long-term sustainable management of forests for the production of wood fiber, ecological services, and other market and non-market goods and services. Typically offered Spring.

FNR 43400 - Tree Physiology

Credit Hours: 3.00. Study of physiology of growth and development of woody plants. Emphasis on the structure and function of trees and their physiological response to environmental factors. Typically offered Fall.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

Major Selectives (10 credits)

- Ecology & Systematics Selective - Credit Hours: 3.00
- Forestry Selective - Credit Hours: 3.00
- Forest Health Selective - Credit Hours: 3.00
- Laboratory in Ecology & Systematics Selective - Credit Hours: 1.00

Other Departmental /Program Course Requirements (54 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing,

textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- FNR Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Ethics Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (8 credits)

- Elective - Credit Hours: 8.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

124 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and

regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Ecology & Systematics Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 35300 - Natural Resources Measurement

Credit Hours: 3.00. An introduction to sampling techniques and fundamental principles for measuring natural resources. Typically offered Spring.

- Laboratory in Ecology & Systematics selective - Credit Hour: 1.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Summer Session

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37050 - Forest Habitats And Communities Practicum

Credit Hours: 1.00. Specific field instruction in forestry and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37200 - Forestry Practicum

Credit Hours: 4.00. Specific field instruction in forestry. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

6 Credits

Fall 3rd Year

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

- Forest Health Selective - Credit Hours: 3.00

FNR 33100 - Forest Ecosystems

Credit Hours: 3.00. Introduction to ecosystem processes, with emphasis on structural dynamics, energy flows, nutrient cycling, spatial patterns, classification and interaction of plant and animal populations. Processes will be related to human activities. Typically offered Fall.

FNR 35700 - Fundamental Remote Sensing

Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.

FNR 43400 - Tree Physiology

Credit Hours: 3.00. Study of physiology of growth and development of woody plants. Emphasis on the structure and function of trees and their physiological response to environmental factors. Typically offered Fall.

12 Credits

Spring 3rd Year

FNR 35500 - Quantitative Methods For Resource Management

Credit Hours: 3.00. Application of analytical and computational techniques for the purpose of making decisions regarding the management of forests. Typically offered Spring.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 40700 - Forest Economics

Credit Hours: 3.00. Implications of unique economic characteristics of forest resources, including a tree as both capital and output, high capital to output ratio, location utility of in-forest uses, long investment periods, and non-market outputs. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

FNR 33900 - Principles Of Silviculture

Credit Hours: 3.00. Silviculture systems; establishment of stands; control of stand composition, growth, and quality. Typically offered Fall.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

- Ethics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Spring 4th Year

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

FNR 40910 - Forest Resources Management

Credit Hours: 3.00. Forest Resources Management focuses on the long-term sustainable management of forests for the production of wood fiber, ecological services, and other market and non-market goods and services. Typically offered Spring.

- Forestry Selecitve - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Sustainable Biomaterials - Process amd Product Design, BS

About the Program

Students learn the basics of sustainability of biomaterials, product design, processing and conservation. Studies focus on sustainable materials resource evaluation, product strength design, lean manufacturing, end of life options, cradle to grave, cradle to cradle, zero impact theories, and use of life cycle assessment techniques. You will gain experience with complex natural resources utilization issues on a local and global scale. You are prepared for management positions in manufacturing industries, particularly the wood products manufacturing and the hardwood cabinet and furniture industries.

Sustainable Biomaterials - Process and Product Design Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Sustainable Biomaterials Process & Product Design include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (107 credits)

Required Major Courses (29 credits)

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

FNR 30200 - Global Sustainability Issues

Credit Hours: 2.00. This course explores global sustainability issues in natural resources with emphasis on forestry, wood products manufacturing, conservation, water management, energy and their impact on the targeted geographic location (such as Central America, Eastern Europe) and the rest of the world. The purpose of this course is to present students, regardless of their disciplinary background, with an overview of the interdisciplinary aspects of sustainable natural resource management. This colloquium course will examine global sustainable natural resources and related issues (including population, poverty, pollution, climate change, deforestation, invasive species, urbanization, habitat loss, cultural traditions, water management, energy, education, technology, and international collaboration). Typically offered Spring.

FNR 31110 - Structure, Identification And Properties Of Woody Biomaterials

Credit Hours: 3.00. An outline and the identification of macro characteristics of commercially important woody biomaterials (color, odor, cellular arrangement, grain patterns, character marks, etc.) through laboratory exercises and field trips. Students will study the cellular structure and arrangement of woody biomaterials, their manufacturing characteristics and uses. Typically offered Spring.

FNR 41800 - Properties Of Wood Related To Manufacturing

Credit Hours: 3.00. Orthotopic nature of wood, grain, texture, moisture content, shrinking, swelling, specific gravity, machining, thermal properties, electrical properties, elastic properties, strength properties, vibration properties, bending, natural characteristics affecting mechanical properties, effect of manufacturing and service environment on mechanical properties, changing quality of available resources and implications of wood quality changes for manufacturing. Typically offered Fall.

FNR 41910 - Furniture Product Development And Strength Design

Credit Hours: 3.00. Qualitative and quantitative principles of furniture construction, product development methodology and strength design principles, furniture performance testing, product sustainability and end of life options (LCA, computer-based applications and solutions). Course features laboratory evaluating, furniture joints and furniture structures. Typically offered Spring.

FNR 42500 - Secondary Wood Products Manufacturing

Credit Hours: 3.00. Secondary wood products manufacturing; structure of the industry, organization of a furniture factory, raw materials, rough mill, finish mill, assembly, finishing, machinery, wood machining, plant layout, production methods, modern industrial engineering concepts; includes visits to manufacturing operations. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

FNR 48410 - Sustainable Furniture Design For CNC Manufacturing

Credit Hours: 3.00. The course objective is to familiarize students with computer Aided Design (CAD), Computer Aided Manufacturing (CAM), CNC router operation, rapid prototyping, basics of secondary wood products manufacturing, and principles of sustainable product development. Typically offered Fall.

Other Departmental /Program Course Requirements (83 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CGT 11000 - Technical Graphics Communications

Credit Hours: 3.00. This course is an introduction to the graphic language used to communicate design ideas using CAD. Topics include sketching, multiview drawings, auxiliary views, pictorial views, working drawings, dimensioning practices, and section views. Typically offered Fall Spring Summer.

EEE 35000 - Introduction To Environmental And Ecological Engineering

Credit Hours: 3.00. Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required. Typically offered Fall Spring Summer.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MET 14300 - Materials And Processes I

Credit Hours: 3.00. An overview of structures, properties, processing, and applications of metals and ceramics commonly used in industry is presented. Problem solving skills are developed in the areas of materials selection, evaluation, measurement, and testing. Typically offered Summer Fall Spring.

MET 24500 - Manufacturing Systems

Credit Hours: 3.00. This course surveys the manufacturing processes and tools commonly used to convert cast and molded, formed, and joined materials into finished products. It includes the fundamentals of material removal, measurement, statistical quality control, assembly processes, process planning and optimization, CNC programming and automated manufacturing. Typically offered Summer Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Physics Selective - Credit Hours: 4.00
- Sustainability Selectives - Credit Hours: 6.00
- FNR Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Ethics Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

TLI 23500 - Introduction To Lean And Sustainable Systems

Credit Hours: 3.00. This course provides the foundation for technology systems processes and practices. The content covers the discussion of current systems issues, basic systems technology processes, and the role of systems engineering professionals in a global business environment. Topics include basic principles of systems thinking, the concepts of performance and cost measures, alternative design concepts, lean processes, and sustainable life-cycle management. Typically offered Fall Spring Summer.

TLI 31600 - Statistical Quality Control

Credit Hours: 3.00. This course introduces the application of statistical and probability tools to develop, implement, and maintain effective quality assurance in technology and service systems. A systems approach to product or service quality from inception to disposal is employed. Factors affecting variation in quality are studied. The concepts and implications of quality from a global business environment are examined. Typically offered Fall Spring Summer.

TLI 43530 - Operations Planning And Management

Credit Hours: 3.00. A study of enterprise operations and management, demand forecasting, capacity analysis, research and development, production, personnel, and sales. Examples of the procedures necessary to provide a product or service are included. The course focuses on the tools necessary to solve problems, such as decision analysis, linear programming, transportation modeling, enterprise resource planning (ERP) systems, and forecasting models. Field trips may be required and industry-sponsored research projects are typically completed. Typically offered Fall Spring Summer.

TLI 33400 - Economic Analysis For Technology Systems

Credit Hours: 3.00. This course examines techniques of economic analysis for systems technologists, engineers, and leaders who evaluate and determine the financial attractiveness of multiple alternatives. Emphasizes economic feasibility and applying time value of money concepts to cost-volume-profit decisions. Topics include present worth, rate of return, benefit-cost, payback,

breakeven analysis, depreciation, economic optimization, and decision-making under uncertainty. Typically offered Fall Spring Summer.

TLI 43540 - Facilities Planning And Material Handling

Credit Hours: 3.00. This course takes a systematic approach to design of facilities and material handling systems for effective and lean production of goods and services. An array of qualitative and quantitative tools and techniques are introduced and utilized, emphasizing lean principles, waste reduction, and overall efficiency of operations. Flow analysis and optimization tools, including computer simulation, are introduced. Strong emphasis is placed on a comprehensive semester-long team project as an integral component of this course. Typically offered Fall Spring Summer.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

ENGL 42100 - Technical Writing

Credit Hours: 3.00. Workplace writing in networked environments for technical contexts. Emphasizes context and user analysis, data analysis/display, project planning, document management, usability, ethics, research, team writing. Typical genres include technical reports, memos, documentation, Web sites. Typically offered Fall Spring Summer.

Electives (8 credits)

- Elective - Credit Hours: 8.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student

organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic

importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

- Ethics Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural

resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

MET 14300 - Materials And Processes I

Credit Hours: 3.00. An overview of structures, properties, processing, and applications of metals and ceramics commonly used in industry is presented. Problem solving skills are developed in the areas of materials selection, evaluation, measurement, and testing. Typically offered Summer Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- FNR Economics Selective - Credit Hours: 3.00
- Sustainability Selectives - Credit Hours: 3.00

15 Credits

Spring 2nd Year

CGT 11000 - Technical Graphics Communications

Credit Hours: 3.00. This course is an introduction to the graphic language used to communicate design ideas using CAD. Topics include sketching, multiview drawings, auxiliary views, pictorial views, working drawings, dimensioning practices, and section views. Typically offered Fall Spring Summer.

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

TLI 23500 - Introduction To Lean And Sustainable Systems

Credit Hours: 3.00. This course provides the foundation for technology systems processes and practices. The content covers the discussion of current systems issues, basic systems technology processes, and the role of systems engineering professionals in a global business environment. Topics include basic principles of systems thinking, the concepts of performance and cost measures, alternative design concepts, lean processes, and sustainable life-cycle management. Typically offered Fall Spring Summer.

- Physics Selective - Credit Hours: 4.00
- Elective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 41800 - Properties Of Wood Related To Manufacturing

Credit Hours: 3.00. Orthotopic nature of wood, grain, texture, moisture content, shrinking, swelling, specific gravity, machining, thermal properties, electrical properties, elastic properties, strength properties, vibration properties, bending, natural characteristics affecting mechanical properties, effect of manufacturing and service environment on mechanical properties, changing quality of available resources and implications of wood quality changes for manufacturing. Typically offered Fall.

ENGL 42100 - Technical Writing

Credit Hours: 3.00. Workplace writing in networked environments for technical contexts. Emphasizes context and user analysis, data analysis/display, project planning, document management, usability, ethics, research, team writing. Typical genres include technical reports, memos, documentation, Web sites. Typically offered Fall Spring Summer.

TLI 31600 - Statistical Quality Control

Credit Hours: 3.00. This course introduces the application of statistical and probability tools to develop, implement, and maintain effective quality assurance in technology and service systems. A systems approach to product or service quality from inception to disposal is employed. Factors affecting variation in quality are studied. The concepts and implications of quality from a global business environment are examined. Typically offered Fall Spring Summer.

- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

EEE 35000 - Introduction To Environmental And Ecological Engineering

Credit Hours: 3.00. Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required. Typically offered Fall Spring Summer.

FNR 31110 - Structure, Identification And Properties Of Woody Biomaterials

Credit Hours: 3.00. An outline and the identification of macro characteristics of commercially important woody biomaterials (color, odor, cellular arrangement, grain patterns, character marks, etc.) through laboratory exercises and field trips. Students will study the cellular structure and arrangement of woody biomaterials, their manufacturing characteristics and uses. Typically offered Spring.

MET 24500 - Manufacturing Systems

Credit Hours: 3.00. This course surveys the manufacturing processes and tools commonly used to convert cast and molded, formed, and joined materials into finished products. It includes the fundamentals of material removal, measurement, statistical quality control, assembly processes, process planning and optimization, CNC programming and automated manufacturing. Typically offered Summer Fall Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

15 Credits

Fall 4th Year

FNR 42500 - Secondary Wood Products Manufacturing

Credit Hours: 3.00. Secondary wood products manufacturing; structure of the industry, organization of a furniture factory, raw materials, rough mill, finish mill, assembly, finishing, machinery, wood machining, plant layout, production methods, modern industrial engineering concepts; includes visits to manufacturing operations. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

FNR 48410 - Sustainable Furniture Design For CNC Manufacturing

Credit Hours: 3.00. The course objective is to familiarize students with computer Aided Design (CAD), Computer Aided Manufacturing (CAM), CNC router operation, rapid prototyping, basics of secondary wood products manufacturing, and principles of sustainable product development. Typically offered Fall.

TLI 43530 - Operations Planning And Management

Credit Hours: 3.00. A study of enterprise operations and management, demand forecasting, capacity analysis, research and development, production, personnel, and sales. Examples of the procedures necessary to provide a product or service are included. The course focuses on the tools necessary to solve problems, such as decision analysis, linear programming, transportation modeling, enterprise resource planning (ERP) systems, and forecasting models. Field trips may be required and industry-sponsored research projects are typically completed. Typically offered Fall Spring Summer.

TLI 33400 - Economic Analysis For Technology Systems

Credit Hours: 3.00. This course examines techniques of economic analysis for systems technologists, engineers, and leaders who evaluate and determine the financial attractiveness of multiple alternatives. Emphasizes economic feasibility and applying time value of money concepts to cost-volume-profit decisions. Topics include present worth, rate of return, benefit-cost, payback, breakeven analysis, depreciation, economic optimization, and decision-making under uncertainty. Typically offered Fall Spring Summer.

- Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

FNR 30200 - Global Sustainability Issues

Credit Hours: 2.00. This course explores global sustainability issues in natural resources with emphasis on forestry, wood products manufacturing, conservation, water management, energy and their impact on the targeted geographic location (such as

Central America, Eastern Europe) and the rest of the world. The purpose of this course is to present students, regardless of their disciplinary background, with an overview of the interdisciplinary aspects of sustainable natural resource management. This colloquium course will examine global sustainable natural resources and related issues (including population, poverty, pollution, climate change, deforestation, invasive species, urbanization, habitat loss, cultural traditions, water management, energy, education, technology, and international collaboration). Typically offered Spring.

FNR 41910 - Furniture Product Development And Strength Design

Credit Hours: 3.00. Qualitative and quantitative principles of furniture construction, product development methodology and strength design principles, furniture performance testing, product sustainability and end of life options (LCA, computer-based applications and solutions). Course features laboratory evaluating, furniture joints and furniture structures. Typically offered Spring.

TLI 43540 - Facilities Planning And Material Handling

Credit Hours: 3.00. This course takes a systematic approach to design of facilities and material handling systems for effective and lean production of goods and services. An array of qualitative and quantitative tools and techniques are introduced and utilized, emphasizing lean principles, waste reduction, and overall efficiency of operations. Flow analysis and optimization tools, including computer simulation, are introduced. Strong emphasis is placed on a comprehensive semester-long team project as an integral component of this course. Typically offered Fall Spring Summer.

- Sustainability Selectives - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Wildlife, BS

About the Program

Learn about wildlife research, management, and education, as well as application of biological, ecological, economic, and social knowledge to wildlife management issues. Studies emphasis understanding ecosystems function, natural and human disturbance, and ecosystem resilience. You are preparing for work in public organizations (state/federal fish and wildlife), not-for-profit organizations (Nature Conservancy, Ducks Unlimited), private consulting firms, or for graduate studies (MS, PhD, DVM). This degree meets the educational standards of The Wildlife Society to become a Certified Wildlife Biologist.

Wildlife Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Wildlife include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (110 credits)

Required Major Courses (43 credits)

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

FNR 25150 - Ecology And Systematics Of Mammals And Birds

Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.

FNR 25250 - Laboratory In Ecology And Systematics Of Mammals And Birds

Credit Hours: 1.00. Basic anatomy, classification, and identification of mammals and birds. Identification deals with representative species from selected phylogenetic and geographic groupings in North America. Typically offered Spring.

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 33100 - Forest Ecosystems

Credit Hours: 3.00. Introduction to ecosystem processes, with emphasis on structural dynamics, energy flows, nutrient cycling, spatial patterns, classification and interaction of plant and animal populations. Processes will be related to human activities. Typically offered Fall.

FNR 34100 - Wildlife Habitat Management

Credit Hours: 3.00. Principles, practices, and justification of the habitat management approach to the manipulation of wildlife populations. Typically offered Spring.

FNR 34800 - Wildlife Investigational Techniques

Credit Hours: 3.00. An introduction to current wildlife research techniques that are used in managing populations and habitats. Laboratory and field exercises are used to gather and analyze data; basic data analysis and written dissemination of results is emphasized. Typically offered Spring.

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37050 - Forest Habitats And Communities Practicum

Credit Hours: 1.00. Specific field instruction in forestry and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37300 - Wildlife Practicum

Credit Hours: 4.00. Specific field instruction in wildlife science and management. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 40800 - Natural Resources Planning

Credit Hours: 3.00. Management concepts and decision making emphasizing formal planning processes including development of objectives, analysis of alternatives, and decision making within the constraints of changing social and political trends, economic feasibility, and sustainability of ecosystem functions for a property. Laboratory activities are focused on the development of a management plan by an interdisciplinary team for a specific area and set of objectives. Typically offered Spring.

FNR 44700 - Vertebrate Population Dynamics

Credit Hours: 4.00. Estimation and analysis of populations; computer modeling of sampling methods, population dynamics, population and habitat management. Knowledge of computer programming not required. Typically offered Fall.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

Major Selectives (10 credits)

- Botany Selective - Credit Hours: 2.00
- Wildlife Disease Selective - Credit Hours: 2.00
- Wildlife Selective - Credit Hours: 6.00

Other Departmental /Program Course Requirements (51 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure,

spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- FNR Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Ethics Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (10 credits)

- Elective - Credit Hours: 10.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness

- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 11900 - Introduction To Forestry And Natural Resources Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Economics Selective - Credit Hours: 3.00

13 Credits

Spring 2nd Year

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 25150 - Ecology And Systematics Of Mammals And Birds

Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.

FNR 25250 - Laboratory In Ecology And Systematics Of Mammals And Birds

Credit Hours: 1.00. Basic anatomy, classification, and identification of mammals and birds. Identification deals with representative species from selected phylogenetic and geographic groupings in North America. Typically offered Spring.

FNR 34800 - Wildlife Investigational Techniques

Credit Hours: 3.00. An introduction to current wildlife research techniques that are used in managing populations and habitats. Laboratory and field exercises are used to gather and analyze data; basic data analysis and written dissemination of results is emphasized. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Summer Session

FNR 37010 - Natural Resources Practicum

Credit Hours: 1.00. Specific field instruction in forestry, fisheries and aquatic sciences and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37050 - Forest Habitats And Communities Practicum

Credit Hours: 1.00. Specific field instruction in forestry and wildlife. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

FNR 37300 - Wildlife Practicum

Credit Hours: 4.00. Specific field instruction in wildlife science and management. Students pay university tuition plus a fee for living facilities and subsistence. Typically offered Summer.

6 Credits

Fall 3rd Year

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

POL 22300 - Introduction To Environmental Policy

Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 33100 - Forest Ecosystems

Credit Hours: 3.00. Introduction to ecosystem processes, with emphasis on structural dynamics, energy flows, nutrient cycling, spatial patterns, classification and interaction of plant and animal populations. Processes will be related to human activities. Typically offered Fall.

FNR 34100 - Wildlife Habitat Management

Credit Hours: 3.00. Principles, practices, and justification of the habitat management approach to the manipulation of wildlife populations. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

- Botany Selective - Credit Hours: 2.00
- Wildlife Selective - Credit Hours: 3.00
- Elective - Credit Hours: 6.00

14 Credits

Fall 4th Year

FNR 44700 - Vertebrate Population Dynamics

Credit Hours: 4.00. Estimation and analysis of populations; computer modeling of sampling methods, population dynamics, population and habitat management. Knowledge of computer programming not required. Typically offered Fall.

FNR 47000 - Fundamentals Of Planning

Credit Hours: 1.00. This course will overview key steps involved in natural resources planning, expose students to a variety of different natural resource plans, and engage students in critically evaluating the effectiveness of planning. (Course meets during weeks 1-5.). Typically offered Fall.

- Ethics Selective - Credit Hours: 3.00
- Wildlife Disease Selective - Credit Hours: 2.00
- Elective - Credit Hours: 3.00

13 Credits

Spring 4th Year

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 40800 - Natural Resources Planning

Credit Hours: 3.00. Management concepts and decision making emphasizing formal planning processes including development of objectives, analysis of alternatives, and decision making within the constraints of changing social and political trends, economic feasibility, and sustainability of ecosystem functions for a property. Laboratory activities are focused on the development of a management plan by an interdisciplinary team for a specific area and set of objectives. Typically offered Spring.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Wildlife Selective - Credit Hours: 3.00
- Elective - Credit Hour: 1.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Fisheries and Aquatic Sciences Minor

16 credits

Required Courses

(7 credits)

FNR 20100 - Marine Biology

Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

Selectives

(9 credits from the following)

FNR 45200 - Aquaculture

Credit Hours: 3.00. Historical perspectives and current practices in aquaculture, including production systems, feeds, water quality requirements, and diseases of commercially important species. Typically offered Spring.

FNR 45300 - Fish Physiology

Credit Hours: 3.00. Presentation and discussion of physiological mechanisms exhibited by freshwater and marine invertebrates and vertebrates. Primary materials used for class presentation and discussions will be examples from primary research literature. Topics include respiration, osmoregulation, stress physiology, absorption and metabolism of compounds, and hormonal control of selected physiological mechanisms. Offered in odd-numbered years. Typically offered Spring.

FNR 45400 - Fisheries Science And Management

Credit Hours: 3.00. Theory and practice of fisheries management, with emphasis on strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, sport and commerical fish populations, and human resource users and non-users are considered as in the setting of appropriate goals and objectives for effective, science-based management. One weekend field laboratory is required. Typically offered Fall.

FNR 45500 - Fish Ecology

Credit Hours: 3.00. The relationship of fishes to the physical, chemical, and biological features of the environment in both natural and perturbed aquatic ecosystems. An emphasis will be placed on diversity in morphology, behavior, feeding, and reproductive strategies as they relate to individual and population adaptation, community structure, and anthropogenic effects. Offered in even-numbered years. Typically offered Spring.

FNR 52600 - Aquatic Animal Health

Credit Hours: 2.00. This is an introductory course designed to provide instruction on the methodology of diagnosis and treatment of parasitic, fungal, bacterial, viral, nutritional, and environmental diseases of fishes and other aquatic organisms (amphibians, reptiles, and bivalves). Courses in chemistry and biology are expected and in animal physiology is preferred, but not required. Typically offered Fall.

FNR 52700 - Ecotoxicology

Credit Hours: 2.00. This course covers theoretical and applied approaches to the science of ecotoxicology, including application of the tools and procedures used to understand toxicant fate and effects in free-ranging animals and ecosystems. Students are expected to be knowledgeable in chemistry, biology, and animal physiology. Typically offered Fall.

FNR 55100 - Advanced Ichthyology

Credit Hours: 3.00. Advanced ichthyology presents an advanced study of the biology of fishes. In particular, the course covers aspects of the morphology, physiology, development, behavior, evolution, diversity, and ecology of fish throughout the world. Typically offered Fall.

FNR 55200 - Advanced Freshwater Ecology

Credit Hours: 3.00. Advanced freshwater ecology presents a comprehensive overview of the form, function, and biological organisms of freshwater ecosystems. Specifically, students learn the fundamental biological and ecological components of continental streams, rivers, and lakes, with some additional consideration given to global freshwaters. Typically offered Fall.

Forest Ecosystems Minor

18 credits

Required Courses

(12 credits)

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 33100 - Forest Ecosystems

Credit Hours: 3.00. Introduction to ecosystem processes, with emphasis on structural dynamics, energy flows, nutrient cycling, spatial patterns, classification and interaction of plant and animal populations. Processes will be related to human activities. Typically offered Fall.

FNR 33900 - Principles Of Silviculture

Credit Hours: 3.00. Silviculture systems; establishment of stands; control of stand composition, growth, and quality. Typically offered Fall.

FNR 35300 - Natural Resources Measurement

Credit Hours: 3.00. An introduction to sampling techniques and fundamental principles for measuring natural resources. Typically offered Spring.

Selectives

(6 credits from the following)

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 23000 - The World's Forests And Society

Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets;

lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

FNR 33300 - Fire Effects In Forest Environments

Credit Hours: 1.00. Use of natural and set prescribed fire as a tool in management of forest and prairie ecosystems. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring.

FNR 35700 - Fundamental Remote Sensing

Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 40700 - Forest Economics

Credit Hours: 3.00. Implications of unique economic characteristics of forest resources, including a tree as both capital and output, high capital to output ratio, location utility of in-forest uses, long investment periods, and non-market outputs. Typically offered Spring.

FNR 43400 - Tree Physiology

Credit Hours: 3.00. Study of physiology of growth and development of woody plants. Emphasis on the structure and function of trees and their physiological response to environmental factors. Typically offered Fall.

FNR 44100 - Forest Entomology

Credit Hours: 3.00. (ENTM 44100) An introduction to the identity, natural history and management of insects affecting forest ecosystems. Topics include biodiversity, natural history and ecology of forest pests; forecasting and assessing the risk of insect

outbreaks; and silvicultural, biological and chemical strategies for preventing and managing insect pests. Offered in odd-numbered years. Typically offered Fall.

FNR 53600 - Ecology Of Disturbance

Credit Hours: 2.00. Advanced lecture-and discussion-based class examining how disturbance shapes the composition and structure of communities and landscapes across major terrestrial biomes. Students will examine and discuss the relationships between disturbance intensity, frequency, and spatial extent and how these characteristics affect ecological processes and ecologically-based management of forest and grassland ecosystems. The class will also examine the synergistic effects of multiple disturbances and the restoration of endemic disturbance regimes in contemporary ecosystems. Course is reading intensive; students will read and discuss on average 3-8 journal articles per week. Typically offered in even years. Typically offered Spring.

FNR 53601 - Ecology Of Disturbance Practicum

Credit Hours: 1.00. This course is the practicum for FNR 53600, hence enrollment is contingent upon enrollment in FNR 53600. Course consists of a one or two week long field trip to a remote site; prior trips have been taken to the Great Smokey National Park over spring break. Course requires an addition travel fee, depending on location visited. Typically offered in even years. Typically offered Spring, but may be offered occasionally during summer session.

Notes

Departmental permission is not required to enroll in this minor.

Other FNR 49800 orFNR 59800 courses, with FNR approval may be used.

For students in FNR majors, courses required in the student's major cannot be used to meet the 6 credits of selectives for this minor.

Furniture Design Minor

18 credits

Required Courses

(18 credits)

AD 53500 - Furniture Design

Credit Hours: 3.00. Examination of furniture design trends and designers. Explore materials and manufacturing processes. Design and build a full-size seating unit. Shop skills required. Permission of instructor required. Typically offered Fall Spring.

FNR 31110 - Structure, Identification And Properties Of Woody Biomaterials

Credit Hours: 3.00. An outline and the identification of macro characteristics of commercially important woody biomaterials (color, odor, cellular arrangement, grain patterns, character marks, etc.) through laboratory exercises and field trips. Students will study the cellular structure and arrangement of woody biomaterials, their manufacturing characteristics and uses. Typically offered Spring.

FNR 41800 - Properties Of Wood Related To Manufacturing

Credit Hours: 3.00. Orthotopic nature of wood, grain, texture, moisture content, shrinking, swelling, specific gravity, machining, thermal properties, electrical properties, elastic properties, strength properties, vibration properties, bending, natural characteristics affecting mechanical properties, effect of manufacturing and service environment on mechanical properties, changing quality of available resources and implications of wood quality changes for manufacturing. Typically offered Fall.

FNR 41910 - Furniture Product Development And Strength Design

Credit Hours: 3.00. Qualitative and quantitative principles of furniture construction, product development methodology and strength design principles, furniture performance testing, product sustainability and end of life options (LCA, computer-based applications and solutions). Course features laboratory evaluating, furniture joints and furniture structures. Typically offered Spring.

FNR 42500 - Secondary Wood Products Manufacturing

Credit Hours: 3.00. Secondary wood products manufacturing; structure of the industry, organization of a furniture factory, raw materials, rough mill, finish mill, assembly, finishing, machinery, wood machining, plant layout, production methods, modern industrial engineering concepts; includes visits to manufacturing operations. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

FNR 48410 - Sustainable Furniture Design For CNC Manufacturing

Credit Hours: 3.00. The course objective is to familiarize students with computer Aided Design (CAD), Computer Aided Manufacturing (CAM), CNC router operation, rapid prototyping, basics of secondary wood products manufacturing, and principles of sustainable product development. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

Urban Forestry Minor

15 credits

Required Courses

(7 credits)

FNR 44400 - Arboricultural Practices

Credit Hours: 4.00. Course covers a broad spectrum of arboriculture principles and techniques, including pruning, transplanting, fertilization, climbing, rigging, removal, cabling, bracing, lightning protection, hazard tree evaluation, tree appraisal, and street tree inventory. Typically offered Fall.

FNR 44500 - Urban Forest Issues

Credit Hours: 3.00. This course presents an array of topics germane to the management of trees in the urban environment. This includes the benefits of trees and general tree care, tree appraisal, tree ordinances, tree inventory and management plans, and tree preservation and construction. Typically offered Spring.

Selectives

(8 credits from the following)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

BTNY 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (ENTM 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

ENTM 10500 - Insects: Friend And Foe

Credit Hours: 3.00. A one-semester course for nonscience students who want to know more about insects - the most numerous organisms on earth. An introduction to insects and their relationship with humankind, including interesting aspects of insect biology; insects in music, decoration, history; use of insects in teaching at the elementary school level; their use in art, photography, and drawing; insects as human food. Typically offered Fall Spring.

FNR 21000 - Natural Resource Information Management

Credit Hours: 3.00. Introduction to natural resource and land information systems and data management technologies. Principles of data storage, organization, and retrieval for both textual and spatial data (geographic information systems), data acquisition, accuracy assessment, mapping, and use of this data in natural resource management are presented. Typically offered Spring.

FNR 22310 - Introduction To Environmental Policy

Credit Hours: 3.00. (POL 22300) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.

FNR 22500 - Dendrology

Credit Hours: 3.00. Field identification, taxonomy, and ecological characteristics of trees, shrubs, and herbs found in forests, prairies, old fields, and wetlands. Typically offered Fall.

FNR 33900 - Principles Of Silviculture

Credit Hours: 3.00. Silviculture systems; establishment of stands; control of stand composition, growth, and quality. Typically offered Fall.

FNR 37500 - Human Dimensions of Natural Resource Management

Credit Hours: 3.00. An introduction to the human dimensions of foresty, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.

FNR 43400 - Tree Physiology

Credit Hours: 3.00. Study of physiology of growth and development of woody plants. Emphasis on the structure and function of trees and their physiological response to environmental factors. Typically offered Fall.

FNR 44100 - Forest Entomology

Credit Hours: 3.00. (ENTM 44100) An introduction to the identity, natural history and management of insects affecting forest ecosystems. Topics include biodiversity, natural history and ecology of forest pests; forecasting and assessing the risk of insect outbreaks; and silvicultural, biological and chemical strategies for preventing and managing insect pests. Offered in odd-numbered years. Typically offered Fall.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

LA 32500 - Planting Design II

Credit Hours: 3.00. Study of plants as unique elements of landscape design. Plants will be studied for their aesthetic and functional uses in the landscape. Various scales of planting and design will be approached. Natural distribution and ecological considerations in planting design will be explored. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

Wildlife Science Minor

17 credits

Required Courses

(11 credits)

FNR 24000 - Wildlife In America

Credit Hours: 3.00. History of the occurrence, exploitation, and management of North America's wildlife resources. Life histories, habitat relationships, and human impacts on selected species. Current conservation practices and future prospects. Typically offered Fall.

FNR 24150 - Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.

FNR 24250 - Laboratory In Ecology And Systematics Of Fish, Amphibians And Reptiles

Credit Hours: 1.00. Basic anatomy, classification, and identification of fishes, amphibians and reptiles. Identification deals with representative species from selected phylogenetic and geographic groupings in North American. Typically offered Fall.

FNR 25150 - Ecology And Systematics Of Mammals And Birds

Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.

FNR 25250 - Laboratory In Ecology And Systematics Of Mammals And Birds

Credit Hours: 1.00. Basic anatomy, classification, and identification of mammals and birds. Identification deals with representative species from selected phylogenetic and geographic groupings in North America. Typically offered Spring.

Selectives

(6 credits from the following)

BIOL 28600 - Introduction To Ecology And Evolution

Credit Hours: 2.00. Evolutionary processes and ecological principles associated with individuals, populations, communities, and ecosystems. Topics include genetic drift, natural selection, adaptation, life tables, population dynamics, competition, predation, biodiversity, and ecological stability, with emphasis on natural systems. Typically offered Spring.

BIOL 48300 - Great Issues: Environmental And Conservation Biology

Credit Hours: 3.00. Concerned with the application of ecological principles to environmental issues, the course introduces fundamental ecology, emphasizing the interplay of theoretical models, natural history, and experimentation. New research developments are stressed, with the outlook for application to environmental management and restoration. Whole-biosphere issues, such as the loss of biological diversity, frame a focus at the population level to understand local and global extinction and community stability. In-depth case studies of endangered ecosystems (both temperate and tropical), with computer modeling, field trips, and discussions of policy formulation, demonstrate the range of tools and information necessary to accomplish coexistence of humans with the rest of nature. Typically offered Fall.

BIOL 58000 - Evolution

Credit Hours: 3.00. A study of evolution as a basic concept of the biological sciences; an examination of current methods of experimentation within the area, as well as evidences for the possible mechanisms of evolutionary change. Typically offered Spring.

BIOL 58500 - Ecology

Credit Hours: 3.00. Ecological processes and dynamics of populations, communities, and ecosystems; physical, physiological, behavioral, and population genetic factors regulating population and community structure; case studies; field studies, and simulation models of life history attributes, competition, predation, parasitism, and mutualism. Typically offered Fall.

FNR 30500 - Conservation Genetics

Credit Hours: 3.00. Fundamentals and principles of genetics, including Mendelian inheritance, genetic mapping & linkage, DNA fingerprinting, phylogeography, and speciation. Topics cover the theoretical and empirical evidence illustrating how mutation, migration, drift, and natural selection influence the evolution of genes in natural populations. Designed for ecologists and natural resource professionals. Typically offered Spring.

FNR 35900 - Spatial Ecology And GIS

Credit Hours: 3.00. Introduction to the principles of landscape ecology and biogeography with a laboratory devoted to the analysis of spatial data using geographic information systems. Typically offered Fall.

FNR 44700 - Vertebrate Population Dynamics

Credit Hours: 4.00. Estimation and analysis of populations; computer modeling of sampling methods, population dynamics, population and habitat management. Knowledge of computer programming not required. Typically offered Fall.

FNR 52600 - Aquatic Animal Health

Credit Hours: 2.00. This is an introductory course designed to provide instruction on the methodology of diagnosis and treatment of parasitic, fungal, bacterial, viral, nutritional, and environmental diseases of fishes and other aquatic organisms (amphibians, reptiles, and bivalves). Courses in chemistry and biology are expected and in animal physiology is preferred, but not required. Typically offered Fall.

FNR 52700 - Ecotoxicology

Credit Hours: 2.00. This course covers theoretical and applied approaches to the science of ecotoxicology, including application of the tools and procedures used to understand toxicant fate and effects in free-ranging animals and ecosystems. Students are expected to be knowledgeable in chemistry, biology, and animal physiology. Typically offered Fall.

Wood Products Manufacturing Technology Minor

18 credits

Required Courses

(18 credits)

FNR 30110 - Sustainable Forest Products Manufacturing

Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossties, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, sustainability initiatives, and trade press and trade associations will be covered. Typically offered Spring.

FNR 31110 - Structure, Identification And Properties Of Woody Biomaterials

Credit Hours: 3.00. An outline and the identification of macro characteristics of commercially important woody biomaterials (color, odor, cellular arrangement, grain patterns, character marks, etc.) through laboratory exercises and field trips. Students will study the cellular structure and arrangement of woody biomaterials, their manufacturing characteristics and uses. Typically offered Spring.

FNR 41800 - Properties Of Wood Related To Manufacturing

Credit Hours: 3.00. Orthotopic nature of wood, grain, texture, moisture content, shrinking, swelling, specific gravity, machining, thermal properties, electrical properties, elastic properties, strength properties, vibration properties, bending, natural characteristics affecting mechanical properties, effect of manufacturing and service environment on mechanical properties, changing quality of available resources and implications of wood quality changes for manufacturing. Typically offered Fall.

FNR 42500 - Secondary Wood Products Manufacturing

Credit Hours: 3.00. Secondary wood products manufacturing; structure of the industry, organization of a furniture factory, raw materials, rough mill, finish mill, assembly, finishing, machinery, wood machining, plant layout, production methods, modern industrial engineering concepts; includes visits to manufacturing operations. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

IT 10400 - Industrial Organization

Credit Hours: 3.00. A detailed survey of organizational structures, operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management. Typically offered Fall Spring Summer.

IT 11400 - Problem-Solving In Manufacturing

Credit Hours: 3.00. The goal is to expose students to many of the current problem-solving processes used in industry. This includes the Six Sigma quality process, project management, and lean manufacturing concepts. Lecture and lab exercises use teamwork, process mapping, project management, and disciplined problem-solving. Typically offered Fall Spring Summer.

Notes

Departmental permission is not required to enroll in this minor.

Department of Horticulture and Landscape Architecture

Overview

Welcome to the Department of Horticulture and Landscape Architecture at Purdue University. The mission of the Department of Horticulture and Landscape Architecture involves both education and discovery. Our faculty is committed to teaching and counseling students, and enjoys a worldwide reputation for excellence in research related to horticultural crops. Our goal is to provide the student with the necessary technical information to be successful in the horticultural field. In addition, we strive to provide students with the analytical skills necessary to interpret new information as the world of horticulture continues to change. The curricula within the Department of Horticulture are designed to provide you with communication skills, analytical skills and sensitivity to cultural diversity necessary for success in an increasingly global economy. Upon graduation, you will leave Purdue with a wealth of information and the skills for continued life-long learning. This commitment to quality education by our faculty makes the Department of Horticulture and Landscape Architecture at Purdue University one of the first places potential employers turn for employees.

Faculty

https://ag.purdue.edu/hla/Pages/directory.aspx

Contact Information

Department of Horticulture & Landscape Architecture

Purdue University

Horticulture Building
625 Agriculture Mall Dr.
West Lafayette, IN 47907
Phone: (765) 494-1300

Email:hlacareers@purdue.edu

Website: http://ag.purdue.edu/hla/Hort

The Main office for the department is located in room 207 of the HORT Building.

Graduate Information

For Graduate Information please see Horticulture and Landscape Architecture Graduate Program Information.

Horticulture: Horticultural Production and Marketing Concentration, BS

About the Program

Horticultural production and marketing prepares students in the production of horticultural crops or management of horticultural enterprises. Graduates may manage greenhouses or nurseries, floral or plant shops, garden centers, orchards, vegetable farms, and farm markets. They may be involved with development, distribution, or sales of equipment, chemicals, or plant materials.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Horticulture Production & Marketing include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (113 credits)

Required Major Courses (18 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

HORT 44500 - Strategic Analysis Of Horticultural Production And Marketing

Credit Hours: 1.00. Based on an approved work experience at a commercial horticultural enterprise, students will explore the management, operational and horticultural setting and strategies used by that enterprise and then submit a comprehensive Enterprise Analysis. A computer-aided oral presentation based on specific aspects of the enterprise and the student's work experience is also required. Typically offered Spring.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

HORT 54100 - Postharvest Technology Of Fruits And Vegetables

Credit Hours: 1.00. (FS 54100) Theoretical and applied aspects of methods being used for enhancing the quality and shelf life of harvested fruits and vegetables. Factors that affect the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing will be emphasized. Weeks 11-15. Typically offered Spring.

Major Selectives (6 credits)

- Horticultural Production Selective - Credit Hours: 3.00
- Horticultural Production Selective - Credit Hours: 3.00

Other Departmental /Program Course Requirements (89 credits)

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Accounting Selective - Credit Hours: 3.00
- Business Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The

behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective (satisfies Science, Technology & Society Seclective for core) - Credit Hours: 1.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (7 credits)

- Elective - Credit Hours: 7.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society

- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

15 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Humanities or Social Sciences Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

- Statistics Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hour: 1.00
- Elective - Credit Hour: 1.00

15 Credits

Spring 2nd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Accounting Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BTNY 35000 - Biotechnology In Agriculture

Credit Hours: 3.00. (HORT 35000) A study of the methods used to produce genetically modified organisms, primarily using gene transfer technology, and the application of these organisms in agriculture. The uses of microbes, plants, and animals in agricultural biotechnology are examined. Social, economic, and ethical issues related to biotechnology are discussed. Typically offered Spring.

- Horticultural Production Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

- Business Selective - Credit Hours: 3.00

- Horticultural Production Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00

13 Credits

Spring 4th Year

HORT 44500 - Strategic Analysis Of Horticultural Production And Marketing

Credit Hours: 1.00. Based on an approved work experience at a commercial horticultural enterprise, students will explore the management, operational and horticultural setting and strategies used by that enterprise and then submit a comprehensive Enterprise Analysis. A computer-aided oral presentation based on specific aspects of the enterprise and the student's work experience is also required. Typically offered Spring.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

HORT 54100 - Postharvest Technology Of Fruits And Vegetables

Credit Hours: 1.00. (FS 54100) Theoretical and applied aspects of methods being used for enhancing the quality and shelf life of harvested fruits and vegetables. Factors that affect the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing will be emphasized. Weeks 11-15. Typically offered Spring.

- Concentration Selective - Credit Hours: 6.00
- Electives - Credit Hours: 6.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture: Landscape Contracting and Management, BS

About the Program

Students selecting landscape contracting and management, are prepared to direct and conduct in "hands-on" fashion, the technical side of landscape construction and plant installation. Graduates of this program often operate a landscape design/build or construction and/or maintenance firm, work as a grounds manager.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Landscape Contracting & Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (115 credits)

Required Major Courses (42 Credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 22300 - AutoCAD Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use AutoCada software for horticultural landscape design and construction applications. Offered during weeks 11-15. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42600 - Landscape Contracting And Management Capstone Experience

Credit Hours: 1.00. Based on approved, completed work experience in a landscape contracting/management company, students will explore operations and management of the enterprise and then submit a comprehensive report. An oral presentation based on specific aspects of the work experience will also be required. Permission of instructor required. Typically offered Fall Spring.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization,

performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

Other Departmental /Program Course Requirements (74 credits)

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships,

student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ASM 21600 - Introduction To Surveying

Credit Hours: 1.00. Introduction to plane surveying, including instruction and practice in the use of surveying instruments. Basic overview of distance/angle measurement, leveling, direction, traversing, and mapping. Each weekly topic includes practical application and field exercises as applied to landscape architecture and forestry. Typically offered Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

SPAN 10100 - Spanish Level I

Credit Hours: 3.00. A beginning Spanish course with emphasis on communicative skills (listening and speaking), literacy skills (reading and writing) and culture. Permission of department required. Typically offered Fall Spring Summer. CTL:IWL 1910 Spanish Level I

SPAN 10200 - Spanish Level II

Credit Hours: 3.00. Continuation of SPAN 10100. Typically offered Fall Spring Summer. CTL:IWL 1911 Spanish Level II

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Statistics Selective (satisfies Information Literacy for core) - Credit Hours: 3.00
- Concentration Selective - Credit Hours - 1.00

HORT 22200 - DynaSCAPE Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use DynaSCAPE software for horticultural landscape design applications. Offered during weeks 6-10. Typically offered Spring.

HORT 22400 - Photoshop Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use Adobe Photoshop software for horticultural applications. Offered during weeks 1-5. Typically offered Spring.

- Supervision/Personnel Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Science, Technology & Society Selective (satisfies Science, Technology& Society Selective for core) - Credit Hour: 1.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Crdit Hours: 3.00

Electives (4 credits)

Elective - Credit Hours: 4.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

14 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

SPAN 10100 - Spanish Level I

Credit Hours: 3.00. A beginning Spanish course with emphasis on communicative skills (listening and speaking), literacy skills (reading and writing) and culture. Permission of department required. Typically offered Fall Spring Summer. CTL:IWL 1910 Spanish Level I

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

17 Credits

Fall 2nd Year

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

SPAN 10200 - Spanish Level II

Credit Hours: 3.00. Continuation of SPAN 10100. Typically offered Fall Spring Summer. CTL:IWL 1911 Spanish Level II

14 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

ASM 21600 - Introduction To Surveying

Credit Hours: 1.00. Introduction to plane surveying, including instruction and practice in the use of surveying instruments. Basic overview of distance/angle measurement, leveling, direction, traversing, and mapping. Each weekly topic includes practical application and field exercises as applied to landscape architecture and forestry. Typically offered Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

HORT 22300 - AutoCAD Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use AutoCada software for horticultural landscape design and construction applications. Offered during weeks 11-15. Typically offered Spring.

HORT 22200 - DynaSCAPE Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use DynaSCAPE software for horticultural landscape design applications. Offered during weeks 6-10. Typically offered Spring.

HORT 22400 - Photoshop Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use Adobe Photoshop software for horticultural applications. Offered during weeks 1-5. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

- Elective - Credit Hours: 2.00

15 Credits

Spring 3rd Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

- Statistics Selective - Credti Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

BTNY 30400 - Introductory Weed Science

Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring.

16 Credits

Spring 4th Year

HORT 42600 - Landscape Contracting And Management Capstone Experience

Credit Hours: 1.00. Based on approved, completed work experience in a landscape contracting/management company, students will explore operations and management of the enterprise and then submit a comprehensive report. An oral presentation based on specific aspects of the work experience will also be required. Permission of instructor required. Typically offered Fall Spring.

- Concentration Selective - Credit Hours: 1.00
- Humanities or Social Sciences Selective - Credits Hours: 3.00
- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00
- Supervision/Personnel Selective - Credit Hours: 3.00
- UCC Science, Technology & Society Selective - Credit Hours: 1.00
- Elective - Credit Hours: 2.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture: Landscape Design, BS

About the Program

Graduates in Landscape Design will be ready to create planting plans and construction site plans for landscape and garden development. They will be able to work with clients to determine requirements and oversee installation of new landscapes, especially at the small commercial/institutional and residential scales.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Landscape Design include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (115 credits)

Required Major Courses (46 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42500 - Landscape Horticulture Capstone Project

Credit Hours: 3.00. Individuals or teams of students will work with local governments, community service agencies or not-for-profit organizations on projects in which students address problems of landscape planting design, landscape installation, and/or landscape management. The supervising faculty advisory committee will identify projects. Under the mentorship of the advisory committee, students will work closely with the sponsoring client entity to define the problem and participate in creating and/or implementing solutions. At project completion, oral presentations will be made to clients to supplement a written project report. Open only to graduation candidates majoring in Landscape Hortculture and Design. Typically offered Fall Spring.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

LA 22700 - Planting Design I

Credit Hours: 3.00. Review of design principles as related to plant design characteristics; design implications of plant responses to environment; review of landscape plants in fall. Typically offered Fall.

LA 32500 - Planting Design II

Credit Hours: 3.00. Study of plants as unique elements of landscape design. Plants will be studied for their aesthetic and functional uses in the landscape. Various scales of planting and design will be approached. Natural distribution and ecological considerations in planting design will be explored. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

Other Departmental /Program Course Requirements (68 credits)

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of

principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Statistics Selective (satisfies Information Literacy for core) - Credit Hours: 3.00

- Supervision/Personnel Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective (satisfies Science, Technology & Society Seclective for core) - Credit Hour: 1.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core)- Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (6 credits)

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society
- Written Communication
- Oral Communication
- Quantitative Reasoning

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

14 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

16 Credits

Fall 2nd Year

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

- Economics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

15 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

- UCC Science, Technology & Society Selective - Credit Hours: 1.00
- Elective - Credit Hours: 1.00

15 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal

aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

LA 22700 - Planting Design I

Credit Hours: 3.00. Review of design principles as related to plant design characteristics; design implications of plant responses to environment; review of landscape plants in fall. Typically offered Fall.

- Statistics Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

LA 32500 - Planting Design II

Credit Hours: 3.00. Study of plants as unique elements of landscape design. Plants will be studied for their aesthetic and functional uses in the landscape. Various scales of planting and design will be approached. Natural distribution and ecological considerations in planting design will be explored. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00

16 Credits

Spring 4th Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 42500 - Landscape Horticulture Capstone Project

Credit Hours: 3.00. Individuals or teams of students will work with local governments, community service agencies or not-for-profit organizations on projects in which students address problems of landscape planting design, landscape installation, and/or landscape management. The supervising faculty advisory committee will identify projects. Under the mentorship of the advisory committee, students will work closely with the sponsoring client entity to define the problem and participate in creating and/or implementing solutions. At project completion, oral presentations will be made to clients to supplement a written project report. Open only to graduation candidates majoring in Landscape Hortculture and Design. Typically offered Fall Spring.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Supervision/Personnel Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture: Landscape Enterprise Management Concentration, BS

About the Program

In addition to their science-based landscape horticultural skills, students selecting landscape enterprise management, are prepared to become account managers in client relations, business managers, as well as supervisors for landscape installation projects and landscape management.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Landscape Enterprise Management include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (115 credits)

Required Major Courses (38 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

HORT 44500 - Strategic Analysis Of Horticultural Production And Marketing

Credit Hours: 1.00. Based on an approved work experience at a commercial horticultural enterprise, students will explore the management, operational and horticultural setting and strategies used by that enterprise and then submit a comprehensive Enterprise Analysis. A computer-aided oral presentation based on specific aspects of the enterprise and the student's work experience is also required. Typically offered Spring.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape

architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

Other Departmental /Program Course Requirements (77 credits)

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape

Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Statistics Selective (satisfies Information Literacy for core) - Credit Hours: 3.00
- Business/Supervision/Personnel Selective - Credit Hours: 3.00
- Business/Supervision/Personnel Selective - Credit Hours: 3.00
- Business Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core)- Credit Hours: 3.00
- UCC Science, Technology, & Society Selective (satisfies Science, Technology & Society Seclective for core) - Credit Hour: 1.00
- Humanities or Social Science Selective - Credit Hours: 3.00

- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (5 credits)

- Elective - Credit Hours: 5.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

14 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

- UCC Humanities Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

16 Credits

Fall 2nd Year

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

- UCC Science, Technology & Society Selective - Credit Hours: 1.00

15 Credits

Spring 2nd Year

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Humanities or Social Sciences Selective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

- Business/Supervision/Personnel Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

MGMT 20010 - Business Accounting

Credit Hours: 3.00. The two primary objectives are to teach the skills to produce financial information-to send the relevant signals to decision makers; and to teach the skills to interpret the financial report-to receive the signals. To meet these objectives the students will gain an understanding of the reasoning behind the processes used to record financial information and the manner in which it is reported to external decision makers; gain an understanding of the four basic statements; and an understanding of the importance of financial statement information in interpreting the performance of organizations. (Not a prerequisite for MGMT 20100.)Typically offered Fall Spring Summer.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

- Statistics Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

15 Credits

Fall 4th Year

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf

management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00

16 Credits

Spring 4th Year

HORT 44500 - Strategic Analysis Of Horticultural Production And Marketing

Credit Hours: 1.00. Based on an approved work experience at a commercial horticultural enterprise, students will explore the management, operational and horticultural setting and strategies used by that enterprise and then submit a comprehensive Enterprise Analysis. A computer-aided oral presentation based on specific aspects of the enterprise and the student's work experience is also required. Typically offered Spring.

- Business/Supervision/Personnel Selective - Credit Hours: 3.00
- Business Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture: Plant Science Concentration, BS

About the Program

Plant science is an option which includes training to improve plants through genetic manipulation and to investigate new methods of propagation, growth, handling, and marketing of horticultural crops. Horticultural scientists work at colleges and universities, state and federal experiment stations, and public or private laboratories and foundations. This curriculum prepares students for scientifically oriented careers such as technicians in plant breeding, propagation, and research industries. It is an excellent preparatory program for students planning to pursue post-graduate study toward a Masters or PhD degree.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Plant Science include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114 credits)

Required Major Courses (16 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 49100 - Special Assignments In Horticulture

Credit Hours: 1.00 to 3.00. Training in research techniques, statistical methods, and record procedures. Assigned research problems. A written report of work accomplished is required. Permission of instructor required. Typically offered Fall Spring Summer.

HORT 49200 - Horticultural Science Capstone Seminar

Credit Hours: 1.00. A seminar class combining career development activities with analysis and presentations centered around relevant problems in horticultural science. Students will draw on a variety of their experience such as undergraduate research (HORT 49100), internships, study abroad programs, and other pre-professional activities. Typically offered Fall Spring.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

HORT 54100 - Postharvest Technology Of Fruits And Vegetables

Credit Hours: 1.00. (FS 54100) Theoretical and applied aspects of methods being used for enhancing the quality and shelf life of harvested fruits and vegetables. Factors that affect the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing will be emphasized. Weeks 11-15. Typically offered Spring.

Other Departmental /Program Course Requirements (98 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and

their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration

of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

STAT 50300 - Statistical Methods For Biology

Credit Hours: 3.00. Introductory statistical methods, with emphasis on applications in biology. Topics include descriptive statistics, binomial and normal distributions, confidence interval estimation, hypothesis testing, analysis of variance, introduction to nonparametric testing, linear regression and correlation, goodness-of-fit tests, and contingency tables. Open only to majors related to the life sciences. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, STAT 35000, STAT 50100, and in no more than one of STAT 50300 and STAT 51100. Typically offered Fall Spring Summer.

- Horticultural Production Selective - Credit Hours: 3.00
- Physics Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective (satisfies Science, Technology & Society Seclective for core) - Credit Hour: 1.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (6 credits)

- Elective - Credit Hours: 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11500 - General Chemistry

Credit Hours: 4.00. Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and non-metals. Required of students majoring in science and students in engineering who are not in CHM 12300. One year of high school chemistry or one semester of college chemistry required. Typically offered Fall Spring Summer. CTL:IPS 1721 General Chemistry I w/lab

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 16010 - Applied Calculus I

Credit Hours: 3.00. Topics include trigonometric and exponential functions; limits and differentiation, rules of differentiation, maxima, minima and optimization; curve sketching, integration, anti-derivatives, fundamental theorem of calculus. Properties of definite integrals and numerical methods. Applications to life, managerial and social sciences. Typically offered Fall Spring Summer.

15 Credits

Spring 1st Year

CHM 11600 - General Chemistry

Credit Hours: 4.00. A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals. Typically offered Fall Spring Summer. CTL:IPS 1722 General Chemistry II w/lab

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

MA 16020 - Applied Calculus II

Credit Hours: 3.00. This course covers techniques of integration; infinite series, convergence tests; differentiation and integration of functions of several variables; maxima and minima, optimization; differential equations and initial value problems; matrices, determinants, eigenvalues and eigenvectors. Applications. Typically offered Fall Spring Summer.

- Elective - Credit Hour: 1.00

15 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

BTNY 31600 - Plant Anatomy

Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

COM 25700 - Public Relations Techniques

Credit Hours: 3.00. This class introduces students to a range of public relations techniques, with a focus on writing. From press releases to new media, this class offers practice and feedback on how to use common public relations tools. Typically offered Fall Spring Summer.

CHM 25701 - Organic Chemistry Laboratory

Credit Hours: 1.00. Laboratory experiments designed to accompany CHM 25700 and to illustrate methods of separation, identification, and preparation of selected organic molecules. Typically offered Fall Spring. Both CHM 25700 + 25701 = CTL:IPS 1723 Organic And Biochemistry w/lab

- UCC Humanities Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BCHM 30900 - Biochemistry Laboratory

Credit Hours: 1.00. Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700. Typically offered Fall Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

- Physics Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 2.00

15 Credits

Fall 3rd Year

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Concentration Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 32100 - Genetics Laboratory

Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

STAT 50300 - Statistical Methods For Biology

Credit Hours: 3.00. Introductory statistical methods, with emphasis on applications in biology. Topics include descriptive statistics, binomial and normal distributions, confidence interval estimation, hypothesis testing, analysis of variance, introduction to nonparametric testing, linear regression and correlation, goodness-of-fit tests, and contingency tables. Open only to majors related to the life sciences. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, STAT 35000, STAT 50100, and in no more than one of STAT 50300 and STAT 51100. Typically offered Fall Spring Summer.

- Concentration Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Written or Oral Communication Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

HORT 49100 - Special Assignments In Horticulture

Credit Hours: 1.00 to 3.00. Training in research techniques, statistical methods, and record procedures. Assigned research problems. A written report of work accomplished is required. Permission of instructor required. Typically offered Fall Spring Summer.

- Horticultural Production Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective - Credit Hour: 1.00
- Elective - Credit Hours: 2.00

15 Credits

Spring 4th Year

HORT 49200 - Horticultural Science Capstone Seminar

Credit Hours: 1.00. A seminar class combining career development activities with analysis and presentations centered around relevant problems in horticultural science. Students will draw on a variety of their experience such as undergraduate research (HORT 49100), internships, study abroad programs, and other pre-professional activities. Typically offered Fall Spring.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

HORT 54100 - Postharvest Technology Of Fruits And Vegetables

Credit Hours: 1.00. (FS 54100) Theoretical and applied aspects of methods being used for enhancing the quality and shelf life of harvested fruits and vegetables. Factors that affect the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing will be emphasized. Weeks 11-15. Typically offered Spring.

- Concentration Selective - Credit Hours: 7.00
- Elective - Credit Hours: 3.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture: Public Horticulture Concentration, BS

About the Program

Public horticulture is a professional program leading to employment in botanical gardens, arboretums and other horticultural establishments in the public sector, as curators of plant collections, educators, plant propagators, illustrators, and writers. Practical training through internships in public gardens is stressed.

Horticulture (multiple concentrations) Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Horticulture: Public Horticulture include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (112 credits)

Required Major Courses (35 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 30600 - History Of Horticulture

Credit Hours: 3.00. The origins and development of agriculture, with specific emphasis on horticulture from prehistory to the present in relation to civilization and modern culture. Typically offered Fall Spring Summer.

HORT 31000 - Planting Design Basics

Credit Hours: 1.00. An introduction to the principles and methods of design and graphic communication as applied to the arrangement of plants in the landscape. The focus will be on small scale, ornamental and educational display plantings. Both herbaceous and woody planting design examples for public gardens, golf courses and other public sites will be presented. Offered during weeks 6-10. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 44000 - Public Garden Management

Credit Hours: 1.00. Based on an approved internship at a public garden, arboretum, or other public horticulture-related institution, students will explore management strategies used by the host institution and then submit a comprehensive report. A computer-aided oral presentation based on specific aspects of the internship program will also be required. An approved internship is required. Typically offered Fall Spring.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

LA 16600 - History And Theory Of Landscape Architecture

Credit Hours: 3.00. A study of the historic evolution of landscape architecture to the status of a recognized profession. The course covers the social, economic, political, climatic, and other factors that have influenced the development of design styles and theories. Typically offered Spring.

Other Departmental /Program Course Requirements (77 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription

and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- Statistics Selective (satisfies Information Literacy for core) - Credit Hours: 3.00
- Communications Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00
- Supervision/Personnel Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC Science, Technology & Society Selective (satisfies Science, Technolofy & Society Selective for core) - Credit Hours: 1.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00

Electives (8 credits)

- Elective - Credit Hours: 8.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness

- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

15 Credits

Spring 1st Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Fall 2nd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

CHM 25700 - Organic Chemistry

Credit Hours: 4.00. Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who require a one semester overview in preparation for biochemistry. Not recommended for majors in the College of Science. Typically offered Fall Spring. Both CHM 25700 + CHM 25701= CTL:IPS 1723 Organic And Biochemistry w/lab

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

- UCC Science, Technology & Society Selective - Credit Hours: 1.00

15 Credits

Spring 2nd Year

BCHM 30700 - Biochemistry

Credit Hours: 3.00. Students will have an understanding of the following content areas: structure/function of amino acids, carbohydrates, lipids and nucleic acids; protein structure, function and purification; basic enzymology; replication, transcription and translation; intermediary metabolism including glycolysis, the citric acid cycle, oxidative phosphorylation, photosynthesis. Students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy. Typically offered Fall Spring Summer.

LA 16600 - History And Theory Of Landscape Architecture

Credit Hours: 3.00. A study of the historic evolution of landscape architecture to the status of a recognized profession. The course covers the social, economic, political, climatic, and other factors that have influenced the development of design styles and theories. Typically offered Spring.

- Economics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

BTNY 30100 - Introductory Plant Pathology

Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

15 Credits

Fall 3rd Year

BTNY 30500 - Fundamentals Of Plant Classification

Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Statistics Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

HORT 30600 - History Of Horticulture

Credit Hours: 3.00. The origins and development of agriculture, with specific emphasis on horticulture from prehistory to the present in relation to civilization and modern culture. Typically offered Fall Spring Summer.

BTNY 30200 - Plant Ecology

Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations. Typically offered Spring.

- Written or Oral Communication Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

14 Credits

Fall 4th Year

ENTM 44600 - Integrated Plant Health Management For Ornamental Plants

Credit Hours: 3.00. (BTNY 44600) Principles and practices for diagnosing and managing diseases, insects, and abiotic disorders of woody and herbaceous ornamental plants and turf. Designed for those students in urban forestry, horticulture, and turf management who want a one-semester course on integrated plant health management. A course in plant pathology is recommended, but not required. Typically offered Fall.

HORT 31000 - Planting Design Basics

Credit Hours: 1.00. An introduction to the principles and methods of design and graphic communication as applied to the arrangement of plants in the landscape. The focus will be on small scale, ornamental and educational display plantings. Both herbaceous and woody planting design examples for public gardens, golf courses and other public sites will be presented. Offered during weeks 6-10. Typically offered Fall.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of

major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Concentration Selective - Credit Hours: 3.00

16 Credits

Spring 4th Year

HORT 44000 - Public Garden Management

Credit Hours: 1.00. Based on an approved internship at a public garden, arboretum, or other public horticulture-related institution, students will explore management strategies used by the host institution and then submit a comprehensive report. A computer-aided oral presentation based on specific aspects of the internship program will also be required. An approved internship is required. Typically offered Fall Spring.

- Communications Selective - Credit Hours: 3.00
- Humanities or Social Sciences Selective - Credit Hours: 3.00
- Supervision/Personnel Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Landscape Architecture, BSLA

About the Program

Landscape architecture allows students to develop abilities in problem solving, analytical thinking, and communication. Three fundamental tracks run through the curriculum - design, technical, and plant materials. First-year students enter the pre-landscape architecture program and learn basic art, graphic communication, and design skills. Based on performance in their first year, qualified students are admitted into the professional landscape architecture program. In their second year, increasingly challenging projects allow students to apply their knowledge. Third-year students complete larger-scale projects and focus on more diverse and technically difficult concepts. Between the third and fourth years, students complete a co-op program wherein students are placed in professional offices nationwide for a minimum of forty weeks. Fourth year students focus on "real-client" projects in urban and regional design.

Landscape Architecture Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Landscape Architecture include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (115 credits)

Required Major Courses (60 credits)

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

LA 11600 - Graphic Communication For Students Of Landscape Architects And Design

Credit Hours: 3.00. Introduction to design and presentation techniques fundamental to landscape architecture. Short projects give students exposure to a variety of presentation materials (pencil, ink, pastel, watercolor and acrylic, paper and board) to freehand lettering, and to two- and three-dimensional illustrations. Materials used are purchased by the student. Typically offered Fall.

LA 11700 - Computer Technology In Design

Credit Hours: 3.00. An introductory course that covers the computer graphics, production, and general skills needed to communicate, create, and implement designs in the field of landscape architecture. The course will include current technology in the following areas: printing and scanning, file management, raster and vector image processing, desktop publishing, and computer aided drafting. Permission of department required. Typically offered Fall.

LA 16600 - History And Theory Of Landscape Architecture

Credit Hours: 3.00. A study of the historic evolution of landscape architecture to the status of a recognized profession. The course covers the social, economic, political, climatic, and other factors that have influenced the development of design styles and theories. Typically offered Spring.

LA 21600 - Landscape Architectural Design I

Credit Hours: 3.00. Landscape architectural site design, an introduction into processes and products. Building on the introduction to graphics in L A 116 this is an introduction to the processes and production of site design and development drawings. Recording, conceptualizing and presenting site design ideas through problem solving projects. Emphasis on hand and computer drafting and drawing skills to communicate design ideas. Permission of department required. Typically offered Spring.

LA 22600 - Landscape Architectural Design II

Credit Hours: 4.00. Methods, principles and the process of designing in the built environment. Basic principles of site organization and composition are presented and applied in a series of exercises and studio projects. Role of the design process is reinforced both as a problem-solving tool and as a means of creativity and ideation. Typically offered Spring.

LA 22700 - Planting Design I

Credit Hours: 3.00. Review of design principles as related to plant design characteristics; design implications of plant responses to environment; review of landscape plants in fall. Typically offered Fall.

LA 24600 - Site Systems I

Credit Hours: 4.00. Properties of hardscape materials, their methods of detailing and specification. Introduction to masonry, wood and site furnishings. Design of pavements, walls, steps, ramps and other common site elements. Standards and methods of detailing and notation are presented in small-format exercises. Typically offered Fall.

LA 25000 - Architectural Design

Credit Hours: 3.00. The course will focus on the language of architecture, from classical periods to current practices and explore the application of traditional systems of proportion and geometry. Typically offered Spring.

LA 30900 - Co-Op Preparation

Credit Hours: 1.00. The material presented in this course consists of a broad overview of the employment opportunities in the professional practice of landscape architecture and the ways to secure an internship. It provides the student with information about career choices in landscape architecture and an appropriate knowledge base with which to make informed internship choices. Students prepare written and graphic documents for seeking employment. Students prepare for interviews and communications leading to employment as an intern in landscape architecture. Course meets during weeks 1-8. Typically offered Spring.

LA 31600 - Landscape Architectural Design III

Credit Hours: 4.00. Design theory and meaning in landscape architecture. Past, current and emerging design theories are investigated via lectures, research assignments and studio projects. Projects gain in size, complexity and depth of meaning. Emphasis on the role theory plays both as a stabilizing force and as a catalyst for change. Typically offered Fall.

LA 32500 - Planting Design II

Credit Hours: 3.00. Study of plants as unique elements of landscape design. Plants will be studied for their aesthetic and functional uses in the landscape. Various scales of planting and design will be approached. Natural distribution and ecological considerations in planting design will be explored. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

LA 32600 - Landscape Architectural Design IV

Credit Hours: 4.00. Community planning and design. Past, current and emerging planning theories are investigated via lectures, research assignments and studio projects. The interrelationship of land use, circulation, and open space are explored using environmental and sustainable principles within a framework of traditional neighborhood design. Typically offered Spring.

LA 34600 - Site Systems II

Credit Hours: 3.00. Earthwork, grading, surface drainage and storm water management. Properties of contour lines and topographic representation. Standards for grading practices, notation and nomenclature. Methods for calculating volumes of cut and fill. Methodology for horizontal and vertical alignment of roads and trails. Typically offered Fall.

LA 35600 - Site Systems III

Credit Hours: 4.00. Methods and standards of construction documentation using current technology. Preparation and packaging of site-related technical drawings and bid packages. Methods for site layout and dimensioning. Organization and composition of planting plans, plant lists, grading plans, lighting plans, and associated detail sheets. Standards and sequence of site-related specification documents. Typically offered Spring.

LA 39000 - Professional Cooperative Programs In Landscape Architecture

Credit Hours: 0.00. Supervised work experiences in landscape architectural offices and in the landscape construction or maintenance industry. Programs must be preplanned and conducted under the direction of the cooperative educational coordinator in cooperation with an employer. Students must submit a summary report of the work experience. Consent of cooperative program coordinator required. Typically offered Fall Spring Summer.

LA 41600 - Landscape Architectural Design V

Credit Hours: 5.00. Understand issues, develop concepts and implement ideas beginning with research and precedents in urban design, which is then applied to the planning and design of complex urban sites, and resolved through detailed site design. Urban design will focus on the relationship and interaction between development patterns and land uses; access circulation and parking; and open space. Typically offered Spring.

LA 42600 - Capstone Course In Landscape Architecture

Credit Hours: 5.00. This course will focus on the integration and application of accumulated knowledge of landscape architecture from the student's previous coursework and internship experience. Students will be challenged to identify and solve problems in community-based projects. The students will also communicate, through reports and presentations, their results and plan to community audiences, faculty, and other students. Students will also do directed readings and then discuss topics related to the current and future practices of landscape architecture and environmental design. Typically offered Spring.

LA 47600 - Professional Practice Of Landscape Architecture

Credit Hours: 2.00. A study of the principles and practice of landscape architecture in private and public offices. The course covers project acquisition, office management, and project implementation procedures. Preparation of a professional compendium is required. Typically offered Fall.

Other Departmental /Program Course Requirements (55 credits)

AD 10500 - Design I

Credit Hours: 3.00. Two-dimensional design fundamentals: concepts and processes. Studio problems are used to introduce

concepts, vocabulary, and skills applicable to continued study in a variety of visual disciplines. Includes introduction to a variety of two-dimensional media and computer applications. Typically offered Summer Fall Spring.

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ASM 21600 - Introduction To Surveying

Credit Hours: 1.00. Introduction to plane surveying, including instruction and practice in the use of surveying instruments. Basic overview of distance/angle measurement, leveling, direction, traversing, and mapping. Each weekly topic includes practical application and field exercises as applied to landscape architecture and forestry. Typically offered Spring.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

- Mathematics or Sciences Selective - Credit Hours: 3.00
- Mathematics or Sciences Selective - Credit Hours: 3.00
- UCC Science, Technology, & Society Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 1.00
- Art & Design Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

- Written or Oral Communications Selection - Credit Hours: 3.00

Electives (5 credits)

- Elective - Credit Hours: 5.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

LA 10100 - Survey Of Landscape Architecture

Credit Hours: 3.00. A general overview of the profession of landscape architecture and a description of Purdue's landscape architecture program. This course will provide entering prelandscape architecture and landscape horticulture-design students a preview of the profession that they have chosen to pursue and will be a general information course for students across the campus who have an interest in becoming familiar with landscape architecture. Typically offered Fall.

LA 11600 - Graphic Communication For Students Of Landscape Architects And Design

Credit Hours: 3.00. Introduction to design and presentation techniques fundamental to landscape architecture. Short projects give students exposure to a variety of presentation materials (pencil, ink, pastel, watercolor and acrylic, paper and board) to freehand lettering, and to two- and three-dimensional illustrations. Materials used are purchased by the student. Typically offered Fall.

15 Credits

Spring 1st Year

AD 10500 - Design I

Credit Hours: 3.00. Two-dimensional design fundamentals: concepts and processes. Studio problems are used to introduce concepts, vocabulary, and skills applicable to continued study in a variety of visual disciplines. Includes introduction to a variety of two-dimensional media and computer applications. Typically offered Summer Fall Spring.

BIOL 11100 - Fundamentals Of Biology II

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

LA 21600 - Landscape Architectural Design I

Credit Hours: 3.00. Landscape architectural site design, an introduction into processes and products. Building on the introduction to graphics in L A 116 this is an introduction to the processes and production of site design and development drawings. Recording, conceptualizing and presenting site design ideas through problem solving projects. Emphasis on hand and computer drafting and drawing skills to communicate design ideas. Permission of department required. Typically offered Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

16 Credits

Fall 2nd Year

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

LA 11700 - Computer Technology In Design

Credit Hours: 3.00. An introductory course that covers the computer graphics, production, and general skills needed to communicate, create, and implement designs in the field of landscape architecture. The course will include current technology in the following areas: printing and scanning, file management, raster and vector image processing, desktop publishing, and computer aided drafting. Permission of department required. Typically offered Fall.

LA 24600 - Site Systems I

Credit Hours: 4.00. Properties of hardscape materials, their methods of detailing and specification. Introduction to masonry, wood and site furnishings. Design of pavements, walls, steps, ramps and other common site elements. Standards and methods of detailing and notation are presented in small-format exercises. Typically offered Fall.

- Economics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

16 Credits

Spring 2nd Year

ASM 21600 - Introduction To Surveying

Credit Hours: 1.00. Introduction to plane surveying, including instruction and practice in the use of surveying instruments. Basic overview of distance/angle measurement, leveling, direction, traversing, and mapping. Each weekly topic includes practical application and field exercises as applied to landscape architecture and forestry. Typically offered Spring.

LA 16600 - History And Theory Of Landscape Architecture

Credit Hours: 3.00. A study of the historic evolution of landscape architecture to the status of a recognized profession. The course covers the social, economic, political, climatic, and other factors that have influenced the development of design styles and theories. Typically offered Spring.

LA 22600 - Landscape Architectural Design II

Credit Hours: 4.00. Methods, principles and the process of designing in the built environment. Basic principles of site organization and composition are presented and applied in a series of exercises and studio projects. Role of the design process is reinforced both as a problem-solving tool and as a means of creativity and ideation. Typically offered Spring.

LA 22700 - Planting Design I

Credit Hours: 3.00. Review of design principles as related to plant design characteristics; design implications of plant responses to environment; review of landscape plants in fall. Typically offered Fall.

- Art & Design Selective - Credit Hours: 3.00

14 Credits

Fall 3rd Year

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

LA 30900 - Co-Op Preparation

Credit Hours: 1.00. The material presented in this course consists of a broad overview of the employment opportunities in the professional practice of landscape architecture and the ways to secure an internship. It provides the student with information about career choices in landscape architecture and an appropriate knowledge base with which to make informed internship choices. Students prepare written and graphic documents for seeking employment. Students prepare for interviews and communications leading to employment as an intern in landscape architecture. Course meets during weeks 1-8. Typically offered Spring.

LA 31600 - Landscape Architectural Design III

Credit Hours: 4.00. Design theory and meaning in landscape architecture. Past, current and emerging design theories are investigated via lectures, research assignments and studio projects. Projects gain in size, complexity and depth of meaning. Emphasis on the role theory plays both as a stabilizing force and as a catalyst for change. Typically offered Fall.

LA 32500 - Planting Design II

Credit Hours: 3.00. Study of plants as unique elements of landscape design. Plants will be studied for their aesthetic and functional uses in the landscape. Various scales of planting and design will be approached. Natural distribution and ecological considerations in planting design will be explored. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

LA 34600 - Site Systems II

Credit Hours: 3.00. Earthwork, grading, surface drainage and storm water management. Properties of contour lines and topographic representation. Standards for grading practices, notation and nomenclature. Methods for calculating volumes of cut and fill. Methodology for horizontal and vertical alignment of roads and trails. Typically offered Fall.

14 Credits

Spring 3rd Year

LA 25000 - Architectural Design

Credit Hours: 3.00. The course will focus on the language of architecture, from classical periods to current practices and explore the application of traditional systems of proportion and geometry. Typically offered Spring.

LA 32600 - Landscape Architectural Design IV

Credit Hours: 4.00. Community planning and design. Past, current and emerging planning theories are investigated via lectures, research assignments and studio projects. The interrelationship of land use, circulation, and open space are explored using environmental and sustainable principles within a framework of traditional neighborhood design. Typically offered Spring.

LA 35600 - Site Systems III

Credit Hours: 4.00. Methods and standards of construction documentation using current technology. Preparation and packaging of site-related technical drawings and bid packages. Methods for site layout and dimensioning. Organization and composition of planting plans, plant lists, grading plans, lighting plans, and associated detail sheets. Standards and sequence of site-related specification documents. Typically offered Spring.

- Mathematics or Sciences Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

16 Credits

Fall & Spring 4th Year

LA 39000 - Professional Cooperative Programs In Landscape Architecture

Credit Hours: 0.00. Supervised work experiences in landscape architectural offices and in the landscape construction or maintenance industry. Programs must be preplanned and conducted under the direction of the cooperative educational coordinator in cooperation with an employer. Students must submit a summary report of the work experience. Consent of cooperative program coordinator required. Typically offered Fall Spring Summer.

Fall 5th Year

LA 41600 - Landscape Architectural Design V

Credit Hours: 5.00. Understand issues, develop concepts and implement ideas beginning with research and precedents in urban design, which is then applied to the planning and design of complex urban sites, and resolved through detailed site design. Urban design will focus on the relationship and interaction between development patterns and land uses; access circulation and parking; and open space. Typically offered Spring.

LA 47600 - Professional Practice Of Landscape Architecture

Credit Hours: 2.00. A study of the principles and practice of landscape architecture in private and public offices. The course covers project acquisition, office management, and project implementation procedures. Preparation of a professional compendium is required. Typically offered Fall.

- Humanities or Social Sciences Selective (30000+ level) - Credit Hours: 3.00
- UCC Science, Technology & Society Selective - Credit Hours: 1.00
- Written or Oral Communications Selection - Credit Hours: 3.00
- Elective - Credit Hour: 1.00

15 Credits

Spring 5th Year

LA 42600 - Capstone Course In Landscape Architecture

Credit Hours: 5.00. This course will focus on the integration and application of accumulated knowledge of landscape architecture from the student's previous coursework and internship experience. Students will be challenged to identify and solve problems in community-based projects. The students will also communicate, through reports and presentations, their results and plan to community audiences, faculty, and other students. Students will also do directed readings and then discuss topics related to the current and future practices of landscape architecture and environmental design. Typically offered Spring.

- Humanities or Social Sciences Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00
- Mathematics or Sciences Selective - Credit Hours: 3.00

14 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

** Students in Landscape Architecture fulfill the foundational mathematics requirement by (1) completing MA 15800 or higher or (2) completing STAT 30100. Enrolling in STAT 30100 requires either successfully completing MA 15300 and MA 15400 or taking the advanced credit examination for MA 15300 and MA 15400 to establish competency. Three (3) credits of MA 15300

or MA 15400 may be used as an unrestricted elective in the College of Agriculture Undergraduate plans of study, but may not be used as Mathematics and Sciences selective.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Sustainable Food and Farming Systems, BS

Overview

Learn how to design and manage a small farm enterprise. Study the principles of sustainable agriculture including non-chemical pest and soil management. Investigate organic, local, and urban agriculture systems and study the resilience of the American food system. Gain hands-on experience at the new Purdue University student farm. This is a comprehensive, science-based degree program that will prepare you to manage low-input farming enterprises and for a career in many other agricultural and environmental professional fields.

Sustainable Food and Farming Systems Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Sustainable Food & Farming Systems include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (114 credits)

Required Major Courses (13 credits)

SFS 21000 - Small Farm Experience I

Credit Hours: 3.00. This is the first course of two designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Spring.

SFS 21100 - Small Farm Experience II

Credit Hours: 3.00. This course is a continuation of SFS 21000 and is designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Fall.

SFS 30100 - Agroecology

Credit Hours: 3.00. This course introduces students to the application of ecological concepts to food production systems and farm management. We will consider species interactions, nutrient and water cycles, regenerative practices, alternative approaches to agriculture, and ecosystem services provided to and by agro-ecosystems. Typically offered Fall.

SFS 30200 - Principles Of Sustainability

Credit Hours: 3.00. Principles of sustainability is an experiential (discussion/debate) course that delivers an expansive overview of the principles of sustainability as they relate to energy and resources, communities, and agriculture. Students will learn to understand and analyze different food and farming systems and how they relate to environmental, economic and social sustainability. Typically offered Fall.

SFS 35000 - Summer Farm Internship

Credit Hours: 0.00. The summer internship will give students the opportunity to spend ten weeks on a farming enterprise, either at the Purdue University student farm, or at another farm in the region. A number of types of internships will be considered, and these might include internships not on farms, but on other farm-related businesses. We will assess these internships on a case-by case basis. The majority of the time spent by students is expected to be farm management work under the supervision of the host farmer. A list of requirements of both intern and host farmer will ensure that interns are engaged in enriching internship activities and not just exploited as laborers. Curricular activities will also be presented at farm visits, workshops and tours. Typically offered Summer.

SFS 35100 - SFS Capstone Project

Credit Hours: 1.00. The SFS Capstone Project is a directed-learning course that will require students to prepare and present a sustainability analysis of a farm enterprise, most likely the enterprise at which they conduct their required summer internship, and

this may be an internship approved at an operation other than a farm. Students will be required to analyze and enterprise taking into account its economic, environmental and social sustainability, and its broader role in sustaining the local and regional economy, environment and community. The analysis will be prepared as a paper and a presentation that will be given to the undergraduates of the SFS program at an SFS program meeting. The paper and the presentation will be prepared in consultation with a faculty mentor from the SFS program committee and will be graded by the faculty mentor. Typically offered Fall Spring Summer.

Other Departmental /Program Course Requirements (101-102 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

BTNY 20700 - The Microbial World

Credit Hours: 3.00. This course delivers a broad synthesis of microbiology, discussing all taxa of the microbial world. The course also discusses a wide range of subjects related to microbiology, including medical microbiology, but it has a strong emphasis on the botanical and environmental sciences. One particular characteristic that separates it from other microbiology courses is the reduced emphasis upon bacteriology, with discussions of the protists and viruses and, especially of the fungi, occurring in greater detail than the other general microbiology courses available. Typically offered Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agronomoy/Horticulture Selective - Credit Hours: 3.00
- Animal Science Selective - Credit Hours: 3.00
- Business Management Selective - Credit Hours: 3.00
- Ecology/Environment Selective - Credit Hours: 6.00
- Food Science Selective - Credit Hours: 3.00
- Pest Management Selectives - Credit Hours: 6.00
- Soil Science Selective - Credit Hours: 3.00
- Systems Modules Selectives - Credit Hours: 6.00
- Economics Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- UCC Humanites Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

AGR 20100 - Communicating Across Culture

Credit Hours: 3.00. This course will provide students with an opportunity to understand their place in a multicultural, multiethnic, multinational country, the United States. It is designed to provide an academic overview of the field of multicultural education as it evolved to this day. The course will offer an introductory overview of the many differences that exist within all human beings. Because the diversity among individuals is endless, we cannot study all differences, but will study a sampling such as race, ethnicity, gender identity, age, social class, disability, learning styles, and religion/spiritual orientation. Issues of poverty, language, and social justice may also be examined in relationship to the above major areas of emphasis. Typically offered Fall Spring.

Electives (5-6 credits)

- Elective - Credit Hours: 5.00 - 6.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12000 - Introduction To Horticulture And Landscape Architecture Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Horticulture and Landscape Architecture. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

BIOL 11000 - Fundamentals Of Biology I

Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

14 Credits

Spring 1st Year

AGRY 10500 - Crop Production

Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

BTNY 11000 - Introduction To Plant Science

Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

SFS 21000 - Small Farm Experience I

Credit Hours: 3.00. This is the first course of two designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Spring.

17 Credits

Fall 2nd Year

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

SFS 21100 - Small Farm Experience II

Credit Hours: 3.00. This course is a continuation of SFS 21000 and is designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Fall.

SFS 30200 - Principles Of Sustainability

Credit Hours: 3.00. Principles of sustainability is an experiential (discussion/debate) course that delivers an expansive overview of the principles of sustainability as they relate to energy and resources, communities, and agriculture. Students will learn to understand and analyze different food and farming systems and how they relate to environmental, economic and social sustainability. Typically offered Fall.

- Agronomy/Horticulture Selective - Credit Hours: 3.00
- Systems Modules Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

AGEC 20300 - Introductory Microeconomics For Food And Agribusiness

Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 27000 - Forest Soils

Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

BTNY 20700 - The Microbial World

Credit Hours: 3.00. This course delivers a broad synthesis of microbiology, discussing all taxa of the microbial world. The course also discusses a wide range of subjects related to microbiology, including medical microbiology, but it has a strong emphasis on the botanical and environmental sciences. One particular characteristic that separates it from other microbiology courses is the reduced emphasis upon bacteriology, with discussions of the protists and viruses and, especially of the fungi, occurring in greater detail than the other general microbiology courses available. Typically offered Spring.

BIOL 22100 - Introduction To Microbiology

Credit Hours: 4.00. The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man. Not available for credit toward graduation for majors in the Department of Biological Sciences. Typically offered Fall Spring. CTL: Microbiology for the Health Sciences

SFS 30100 - Agroecology

Credit Hours: 3.00. This course introduces students to the application of ecological concepts to food production systems and farm management. We will consider species interactions, nutrient and water cycles, regenerative practices, alternative approaches to agriculture, and ecosystem services provided to and by agro-ecosystems. Typically offered Fall.

- Systems Modules Selective - Credit Hours: 3.00

15-16 Credits

Fall 3rd Year

AGR 20100 - Communicating Across Culture

Credit Hours: 3.00. This course will provide students with an opportunity to understand their place in a multicultural, multiethnic, multinational country, the United States. It is designed to provide an academic overview of the field of multicultural education as it evolved to this day. The course will offer an introductory overview of the many differences that exist within all human beings. Because the diversity among individuals is endless, we cannot study all differences, but will study a sampling such as race, ethnicity, gender identity, age, social class, disability, learning styles, and religion/spiritual orientation. Issues of poverty,

language, and social justice may also be examined in relationship to the above major areas of emphasis. Typically offered Fall Spring.

ANSC 23000 - Physiology Of Domestic Animals

Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

- Pest Management Selective - Credit Hours: 3.00
- Soil Science Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Animal Science Selective - Credit Hours: 3.00
- Pest Management Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00

15 Credits

Summer Session

SFS 35000 - Summer Farm Internship

Credit Hours: 0.00. The summer internship will give students the opportunity to spend ten weeks on a farming enterprise, either at the Purdue University student farm, or at another farm in the region. A number of types of internships will be considered, and these might include internships not on farms, but on other farm-related businesses. We will assess these internships on a case-by case basis. The majority of the time spent by students is expected to be farm management work under the supervision of the host farmer. A list of requirements of both intern and host farmer will ensure that interns are engaged in enriching internship activities and not just exploited as laborers. Curricular activities will also be presented at farm visits, workshops and tours. Typically offered Summer.

Fall 4th Year

SFS 35100 - SFS Capstone Project

Credit Hours: 1.00. The SFS Capstone Project is a directed-learning course that will require students to prepare and present a sustainability analysis of a farm enterprise, most likely the enterprise at which they conduct their required summer internship, and this may be an internship approved at an operation other than a farm. Students will be required to analyze and enterprise taking into account its economic, environmental and social sustainability, and its broader role in sustaining the local and regional economy, environment and community. The analysis will be prepared as a paper and a presentation that will be given to the undergraduates of the SFS program at an SFS program meeting. The paper and the presentation will be prepared in consultation with a faculty mentor from the SFS program committee and will be graded by the faculty mentor. Typically offered Fall Spring Summer.

- Business Management Selective - Credit Hours: 3.00
- Economics Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

13 Credits

Spring 4th Year

- Ecology/Environment Selectives - Credit Hours: 6.00
- Food Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00 - 3.00

14-15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Horticulture Minor

16 credits

Required Courses

(7 credits)

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 11000 - Survey Of Horticulture

Credit Hours: 1.00. A survey of the field of horticulture, with emphasis on horticultural information and career opportunities. This course will utilize a lecture format with a combination of presentations by the instructor and guest speakers with expertise and experience in specialized areas of horticulture. Typically offered Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

Selectives

(9 credits from the following)

HORT 21700 - Woody Landscape Plants

Credit Hours: 4.00. Recognition and identification of woody landscape plants; plant characteristics in terms of landscape function. Typically offered Fall.

HORT 21800 - Herbaceous Landscape Plants

Credit Hours: 3.00. Covers important herbaceous ornamentals, with emphasis on annuals, perennials, bulbs, and ground covers; recognition; cultural requirements; and use in landscape plantings. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 22200 - DynaSCAPE Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use DynaSCAPE software for horticultural landscape design applications. Offered during weeks 6-10. Typically offered Spring.

HORT 22300 - AutoCAD Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use AutoCada software for horticultural landscape design and construction applications. Offered during weeks 11-15. Typically offered Spring.

HORT 22400 - Photoshop Applications In Horticulture

Credit Hours: 1.00. This course will teach students how to use Adobe Photoshop software for horticultural applications. Offered during weeks 1-5. Typically offered Spring.

HORT 30100 - Plant Physiology

Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall.

HORT 30600 - History Of Horticulture

Credit Hours: 3.00. The origins and development of agriculture, with specific emphasis on horticulture from prehistory to the present in relation to civilization and modern culture. Typically offered Fall Spring Summer.

HORT 31000 - Planting Design Basics

Credit Hours: 1.00. An introduction to the principles and methods of design and graphic communication as applied to the arrangement of plants in the landscape. The focus will be on small scale, ornamental and educational display plantings. Both herbaceous and woody planting design examples for public gardens, golf courses and other public sites will be presented. Offered during weeks 6-10. Typically offered Fall.

HORT 31500 - Landscape Design

Credit Hours: 3.00. An introduction to the landscape design process. The focus will be on smaller sites, constructed site systems and planting design. Graphic skills will emphasize techniques for drawing site plans and other illustrations. Typically offered Fall.

HORT 31600 - Landscape Construction

Credit Hours: 3.00. An introduction to the primary elements and systems of the constructed landscape, including landform, edging, paving, retaining wall, decking, low-voltage lighting, irrigation, drainage and ornamental water systems. Typically offered Spring.

HORT 31700 - Landscape Contracting And Management

Credit Hours: 3.00. Principles and practices applicable to the installation and management of landscape plants. Topics include site and project assessment, site modification and plant installation, the business practices of estimating and bidding, and plant management. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 36000 - Flower Arrangement And Indoor Plant Management

Credit Hours: 3.00. Principles of flower arrangements and displays. Identification, culture, propagation, and use of plants for indoor plantings. Laboratory materials fee required. Typically offered Fall Spring.

HORT 37000 - Professional Floral Design

Credit Hours: 3.00. Principles and techniques of commercial-scale floral design for weddings, funerals, hospitals, personal, and parties. Design construction for fresh, dried, and silk materials. Survey of retail florist management. Permission of department required. Typically offered Fall.

HORT 40300 - Tropical Horticulture

Credit Hours: 3.00. An introduction to the agriculture of the tropics and subtropics, emphasizing horticultural crops. Offered in even-numbered years. Typically offered Fall Spring Summer.

HORT 42000 - Ornamental Plant Production

Credit Hours: 3.00. An intensive study of specific production technologies used to commercially grow landscape and floriculture crops, including greenhouse and nursery management. The course will have an emphasis on the growth and development of major floral and nursery crops as influenced by the environment and cultural techniques. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall.

HORT 42100 - Fruit Production

Credit Hours: 3.00. This course will teach the science and practice of temperate fruit production with emphasis on pome fruit (apples, pears), stone fruit (peaches, plums, cherries), berry crops (strawberries, brambles, blueberries) and grapes. Principles and concepts will be an important part of the class integrating knowledge of plant physiology, biochemistry and post-harvest physiology. The course will emphasize sustainable production practices and prepare students to think critically to solve fruit production problems. Typically offered Fall.

HORT 42200 - Vegetable And Herb Production

Credit Hours: 3.00. Sustainable principles, practices, establishment, projection, maintenance and harvesting of vegetable crops. Typically offered Spring.

HORT 42500 - Landscape Horticulture Capstone Project

Credit Hours: 3.00. Individuals or teams of students will work with local governments, community service agencies or not-for-profit organizations on projects in which students address problems of landscape planting design, landscape installation, and/or landscape management. The supervising faculty advisory committee will identify projects. Under the mentorship of the advisory

committee, students will work closely with the sponsoring client entity to define the problem and participate in creating and/or implementing solutions. At project completion, oral presentations will be made to clients to supplement a written project report. Open only to graduation candidates majoring in Landscape Hortculture and Design. Typically offered Fall Spring.

HORT 43500 - Principles Of Marketing And Management For Horticultural Businesses

Credit Hours: 4.00. Principles of marketing and business management in the horticultural industries; market organization, performance, and planning; financial planning, pricing, promotion, cost control, and legal aspects of retailing. Case studies in direct farm, floral, and garden center management. Typically offered Fall.

HORT 44000 - Public Garden Management

Credit Hours: 1.00. Based on an approved internship at a public garden, arboretum, or other public horticulture-related institution, students will explore management strategies used by the host institution and then submit a comprehensive report. A computer-aided oral presentation based on specific aspects of the internship program will also be required. An approved internship is required. Typically offered Fall Spring.

HORT 44500 - Strategic Analysis Of Horticultural Production And Marketing

Credit Hours: 1.00. Based on an approved work experience at a commercial horticultural enterprise, students will explore the management, operational and horticultural setting and strategies used by that enterprise and then submit a comprehensive Enterprise Analysis. A computer-aided oral presentation based on specific aspects of the enterprise and the student's work experience is also required. Typically offered Spring.

HORT 45000 - In The English Landscape:Integrating History, Horticulture, and Landscape Architecture

Credit Hours: 3.00. Intensive four-weeks in residence in Corsham, UK with visits to significant sites to examine the intersections between human culture and the natural environment that results in the developed landscape. Offered in even-numbered years. Permission of instructor required. Typically offered Summer.

HORT 49100 - Special Assignments In Horticulture

Credit Hours: 1.00 to 3.00. Training in research techniques, statistical methods, and record procedures. Assigned research problems. A written report of work accomplished is required. Permission of instructor required. Typically offered Fall Spring Summer.

HORT 50600 - Commercial Grape And Wine Production

Credit Hours: 3.00. (FS 50600) A study of professional grape growing and wine production with an emphasis on Midwestern climates, adapted varieties, and recommended wine styles. This course is especially intended for upper level undergraduate, or graduate students in the College of Agriculture that have completed basic course work in plant sciences, biology and chemistry. Students will learn the principles of viticulture and enology and the practices of commercial grape growing and wine making. Must be 21 years old. Permission of instructor required. Typically offered Fall.

HORT 51300 - Nutrition Of Horticulture Crops

Credit Hours: 1.00. An integrated course about plant nutrition focused on horticultural crops. The unique features of nutrient availability in a soil-less horticultural media will be highlighted. An emphasis will be placed on understanding the physiological basis of plant responses to nutrient application. Weeks 1-5. Typically offered Spring.

HORT 54100 - Postharvest Technology Of Fruits And Vegetables

Credit Hours: 1.00. (FS 54100) Theoretical and applied aspects of methods being used for enhancing the quality and shelf life of harvested fruits and vegetables. Factors that affect the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing will be emphasized. Weeks 11-15. Typically offered Spring.

HORT 55300 - Plant Growth And Development

Credit Hours: 3.00. (BTNY 55300) Topics include seed dormancy, cell expansion and plant growth, pattern formation, phase transition, flowering, pollination and fertilization, seed development, fruit development, and senescence. This course is the second in a series of team-taught courses in the core curriculum of the Purdue Plant Biology Program. Typically offered Spring.

HORT 59000 - Special Studies In Horticulture

Credit Hours: 1.00 to 3.00. Special studies in horticulture not covered in regular coursework. The field in which work is offered will be indicated in the student's record. Permission of instructor required. Typically offered Spring Fall Summer.

SFS 21000 - Small Farm Experience I

Credit Hours: 3.00. This is the first course of two designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Spring.

SFS 21100 - Small Farm Experience II

Credit Hours: 3.00. This course is a continuation of SFS 21000 and is designed to help students gain an understanding of what is needed to establish a productive small farm enterprise. There will be short field trips to local small farming enterprises. Classes will also be taught by guest lecturers and local farmers who have been successful at establishing small farming enterprises. Students in the class will be responsible for working on the Purdue Student Farm to gain practical experience on the topics and concepts being taught in the class. Typically offered Fall.

Notes

Departmental permission is not required to enroll in this minor.

Turf Management Minor

13 credits

Required Courses

(10 credits)

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

HORT 21000 - Fundamentals Of Turfgrass Culture

Credit Hours: 3.00. (AGRY 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

HORT 21100 - Fundamentals of Turfgrass Culture Laboratory

Credit Hours: 1.00. (AGRY 21100) Companion lab to AGRY 21000. Laboratory exercises will focus on turfgrass and seed anatomy, morphology, identification as well as the hands-on basic principles of turfgrass culture. Designed for the student who intends to pursue a career in turfgrass management and plans to enroll in AGRY 51000. Enrollment preference will be given to Turfgrass Science Majors. Typically offered Spring.

Selectives

(3 credits from the following)

AGRY 51400 - Environmental Stress Management For Turfgrass

Credit Hours: 1.00. Designed for students who desire an understanding of how environmental stresses influence turfgrass growth and how they can be managed with cultural practices. The course covers current research findings in stress management and integrates turfgrass environmental physiology with turfgrass management. Typically offered Fall.

AGRY 36500 - Soil Fertility

Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

BTNY 44300 - Arthropods And Diseases Of Turfgrass

Credit Hours: 3.00. (ENTM 44300) This course is designed to introduce students to the biology, ecology, and management of arthropods and diseases associated with turfgrass ecosystems. The course is divided into two discrete segments with a focus on arthropods during the first half of the semester and diseases during the second half of the semester. Typically offered Spring.

ENTM 44300 - Arthropods And Diseases Of Turfgrass

Credit Hours: 3.00. (BTNY 44300) The course is designed to introduce students to the biology, ecology, and management of arthropods and diseases associated with turfgrass ecosystems. The course is divided into two discrete segments with a focus on arthropods during the first half of the semester and diseases during the second half of the semester. Typically offered Spring.

Notes

Departmental permission is not required to enroll in this minor.

Students in the following majors/concentrations cannot obtain a Turf Management Minor:

- Turf Management and Science

Department of Youth Development and Agricultural Education

Overview

Welcome to the Department of Youth Development and Agricultural Education at Purdue University. The department's motto is "Empower, Educate, and Enhance."

These three very powerful words clearly and succinctly identify the purposes of the department. Empowering, Educating and Enhancing is accomplished by this interdisciplinary department with undergraduate programs in Agricultural Education and Agricultural Communication and a nationally recognized graduate program focused on learning and communication in the context of agriculture.

Faculty

https://ag.purdue.edu/Pages/directory.aspx.

Contact Information

Youth Development & Agricultural Education

Purdue University
Agriculture Administration Building
615 West State Street
West Lafayette, IN 47907
Phone: (765) 494-8423
Email:undergrad@ydae.purdue.edu

Website: http://ydae.purdue.edu/undergrad/aged

The Main office for the department is located in Room 214 of the AGAD Building.

Graduate Information

For Graduate Information please see Youth Development and Agricultural Education Graduate Program Information.

Agricultural Communication, BS

About the Program

Prepare for a profession that serves business and society by promoting awareness of food, agriculture, and science issues among rural and urban audiences. Purdue agricultural communication majors gain skills and experience in public relations, marketing, journalism, and new media through diverse coursework and competitive internships. Through the program's design, students have the advantage of excelling in communication, science, and agricultural courses-a combination future employers value. Though situated within a large university, the agricultural communication program offers a close-knit community in which students receive personal attention from faculty and staff in the College of Agriculture.

Agricultural Communication Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Communication include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

120 credits required for graduation

Departmental/Program Major Courses (111 credits)

Required Major Courses (9 credits)

YDAE 15200 - Agricultural Communication Seminar

Credit Hours: 3.00. This course provides an introduction to agricultural communication as a professional field, including its current status and role within the larger U.S. mass media system. The course will also provide an overview of career options and professional skills and competencies required of agricultural communicators. Typically offered Fall.

YDAE 46000 - Agricultural Publishing

Credit Hours: 3.00. Learning experiences in all phases of agricultural publishing, including audience analysis, generating story ideas, researching, interviewing, writing, editing, photography, page design, desktop publishing, printing specifications and estimates, and distribution. Typically offered Fall Spring Summer.

YDAE 48000 - Agricultural Communication Capstone Seminar

Credit Hours: 3.00. Prepares graduating students for entry to the workplace, assesses and enhances their communication knowledge and skills, and provides project experiences that will demonstrate their ability to communicate scientific and technical information through a variety of media. Projects will include student presentations and magazine style articles on issues of concern to agricultural and general audiences; and a final project that requires students to conceive and create a web site that uses converging media to communicate effectively a topical issue. Typically offered Fall.

Other Departmental /Program Course Requirements (102 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the

food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12100 - Introduction To Youth Development And Agricultural Education Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Youth Development and Agricultural Education which includes Agricultural Communication and Agricultural Education. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and

regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Math/Science Selective - Credit Hours: 3.00

AGR 20100 - Communicating Across Culture

Credit Hours: 3.00. This course will provide students with an opportunity to understand their place in a multicultural, multiethnic, multinational country, the United States. It is designed to provide an academic overview of the field of multicultural education as it evolved to this day. The course will offer an introductory overview of the many differences that exist within all human beings. Because the diversity among individuals is endless, we cannot study all differences, but will study a sampling such as race, ethnicity, gender identity, age, social class, disability, learning styles, and religion/spiritual orientation. Issues of poverty, language, and social justice may also be examined in relationship to the above major areas of emphasis. Typically offered Fall Spring.

COM 20400 - Critical Perspectives On Communication

Credit Hours: 3.00. Introduction to critical thinking and writing about communication. Draws on humanistic and qualitative traditions to help students learn and apply critical approaches to understanding communication. . Typically offered Summer Fall Spring.

COM 25000 - Mass Communication And Society

Credit Hours: 3.00. A survey of the print, broadcast, and film media in their relationship and influence on society. Study topics include: mass communication theories, documentaries, commercialism, news media, media effects and control, feedback, educational broadcasting, and audience analysis. Typically offered Fall Spring Summer. CTL:ICM 1102 Introduction To Mass Communication

COM 31800 - Principles Of Persuasion

Credit Hours: 3.00. Persuasion and its effects, ranging from individual influences to societal impacts. Various perspectives and models of persuasion are examined, including classical and modern approaches. Both theoretical and pragmatic considerations are introduced. Typically offered Fall Spring Summer.

COM 25200 - Writing For Mass Media

Credit Hours: 3.00. Labor intensive course teaches basics of newspaper writing, broadcast writing, news releases, and online journalism. Typically offered Summer Fall Spring.

COM 31100 - Copy Editing

Credit Hours: 3.00. Study of, and practice in, copyreading and headline writing. Laboratory practice includes copy editing on video-display terminals. Typically offered Summer Fall Spring.

- Communication or AGCM Selective - Credit Hours: 8.00
- Communication or AGCM 300+ Selective - Credit Hours: 3.00
- AGCM or Science Communication Selective - Credit Hours: 3.00
- Agricultural Selective - Credit Hours: 15.00
- Agricultural 30000+ Selective - Credit Hours: 6.00

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

- UCC Humanities Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- UCC STS Selective (satisfies Science, Technology & Society Selective for core) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

Electives (9 credits)

- Elective - Credit Hours: 9.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

120 semester credits required for Bachelor of Science degree

2.0 GPA required for Bachelor of Science degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12100 - Introduction To Youth Development And Agricultural Education Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Youth Development and Agricultural Education which includes Agricultural Communication and Agricultural Education. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

YDAE 15200 - Agricultural Communication Seminar

Credit Hours: 3.00. This course provides an introduction to agricultural communication as a professional field, including its current status and role within the larger U.S. mass media system. The course will also provide an overview of career options and professional skills and competencies required of agricultural communicators. Typically offered Fall.

- Humanities or Social Science Selective - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00

15 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

COM 25000 - Mass Communication And Society

Credit Hours: 3.00. A survey of the print, broadcast, and film media in their relationship and influence on society. Study topics include: mass communication theories, documentaries, commercialism, news media, media effects and control, feedback, educational broadcasting, and audience analysis. Typically offered Fall Spring Summer. CTL:ICM 1102 Introduction To Mass Communication

- Agricultural Selective - Credit Hours: 3.00
- Biological Science Selective - Credit Hours: 4.00

16 Credits

Fall 2nd Year

AGR 20100 - Communicating Across Culture

Credit Hours: 3.00. This course will provide students with an opportunity to understand their place in a multicultural, multiethnic, multinational country, the United States. It is designed to provide an academic overview of the field of multicultural education as it evolved to this day. The course will offer an introductory overview of the many differences that exist within all human beings. Because the diversity among individuals is endless, we cannot study all differences, but will study a sampling such as race, ethnicity, gender identity, age, social class, disability, learning styles, and religion/spiritual orientation. Issues of poverty, language, and social justice may also be examined in relationship to the above major areas of emphasis. Typically offered Fall Spring.

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

COM 20400 - Critical Perspectives On Communication

Credit Hours: 3.00. Introduction to critical thinking and writing about communication. Draws on humanistic and qualitative

traditions to help students learn and apply critical approaches to understanding communication. . Typically offered Summer Fall Spring.

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- UCC Science, Technology, & Society Selective - Credit Hours: 3.00

15 Credits

Spring 2nd Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

COM 31800 - Principles Of Persuasion

Credit Hours: 3.00. Persuasion and its effects, ranging from individual influences to societal impacts. Various perspectives and models of persuasion are examined, including classical and modern approaches. Both theoretical and pragmatic considerations are introduced. Typically offered Fall Spring Summer.

- Agricultural Selective - Credit Hours: 3.00
- Communication or AGCM Selective - Credit Hours: 2.00
- Mathematics or Science Selective - Credit Hours: 3.00

14 Credits

Fall 3rd Year

COM 25200 - Writing For Mass Media

Credit Hours: 3.00. Labor intensive course teaches basics of newspaper writing, broadcast writing, news releases, and online journalism. Typically offered Summer Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

- Agricultural Selective - Credit Hours: 6.00
- Communication or AGCM Selective - Credit Hours: 3.00

15 Credits

Spring 3rd Year

YDAE 46000 - Agricultural Publishing

Credit Hours: 3.00. Learning experiences in all phases of agricultural publishing, including audience analysis, generating story ideas, researching, interviewing, writing, editing, photography, page design, desktop publishing, printing specifications and estimates, and distribution. Typically offered Fall Spring Summer.

- Agricultural Selective (30000+ Level) - Credit Hours: 3.00
- Communication or AGCM Selective - Credit Hours: 3.00
- UCC Humanities Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

YDAE 48000 - Agricultural Communication Capstone Seminar

Credit Hours: 3.00. Prepares graduating students for entry to the workplace, assesses and enhances their communication knowledge and skills, and provides project experiences that will demonstrate their ability to communicate scientific and technical information through a variety of media. Projects will include student presentations and magazine style articles on issues of

concern to agricultural and general audiences; and a final project that requires students to conceive and create a web site that uses converging media to communicate effectively a topical issue. Typically offered Fall.

COM 31100 - Copy Editing

Credit Hours: 3.00. Study of, and practice in, copyreading and headline writing. Laboratory practice includes copy editing on video-display terminals. Typically offered Summer Fall Spring.

- Agricultural Selective - Credit Hours: 3.00
- Communication or AGCM Selective (30000+ level) - Credit Hours: 3.00
- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

15 Credits

Spring 4th Year

- AGCM or Science Communication Selective - Credit Hours: 3.00
- Agricultural Selective (30000+ level) - Credit Hours: 3.00
- Humanities or Social Science Selective - Credit Hours: 3.00
- Electives - Credit Hours: 6.00

15 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Agricultural Education, BS

About the Program

Agricultural education students combine their interest in agriculture with their desire to work with people. Students are prepared to teach agricultural science, business, and related subjects in junior high, high school, or college settings. They also can pursue careers in agricultural service industries. There is a high demand for agricultural science and business teachers in Indiana and across the United States.

Agricultural Education Website

Degree Requirements and Supplemental Information

The full Program Requirements for 2016-17 Agricultural Education include all Supplemental Information and selective lists of those categories which a student must fulfill in order to earn their degree. These are intended to be printer-friendly, but include less descriptive course detail.

Please see below for program requirements and the necessary degree fulfillments.

128 credits required for graduation

Departmental/Program Major Courses (128 credits)

Required Major Courses (10 credits)

YDAE 31800 - Coordination Of Supervised Agricultural Experience Programs

Credit Hours: 3.00. Record keeping and supervisory skills needed to advise and coordinate supervised agricultural experience programs for secondary agricultural science and business students. Integration of supervised agricultural experiences with programming in youth organizations and classroom instruction for secondary agricultural science and business classrooms. Typically offered Fall.

YDAE 31900 - Planning Agricultural Science And Business Programs

Credit Hours: 3.00. Development of course content plans that coordinate and utilize agricultural science and business, community resources, FFA, and supervised agricultural experience programs. Typically offered Spring.

YDAE 44000 - Methods Of Teaching Agricultural Education

Credit Hours: 3.00. Principles and procedures for teaching agricultural science and business in public schools. Must be admitted to teacher education program. Typically offered Fall.

YDAE 44100 - Field Experience In Agricultural Education Programs

Credit Hours: 1.00 to 3.00. Field experience in agricultural science and business programs to include observation and participation in the teaching process and program development activities. Typically offered Fall Spring.

Other Departmental /Program Course Requirements (118 credits)

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12100 - Introduction To Youth Development And Agricultural Education Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Youth Development and Agricultural Education which includes Agricultural Communication and Agricultural Education. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 33100 - Principles Of Selling In Agricultural Business

Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

AGRY 37500 - Crop Production Systems

Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

- ASM 1XXXX Welding Transfer Credits - Credit Hours: 3.00

ASM 20100 - Construction And Maintenance

Credit Hours: 3.00. Fundamental principles in the selection and use of tools for the construction and maintenance of agricultural and related facilities, equipment, and machines. Areas covered include small engines, concrete and masonry, wood, plumbing, electricity, and metal. Typically offered Fall Spring.

- Biological Science Selective - Credit Hours: 4.00
- Biological Science Selective - Credit Hours: 4.00

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

MA 15910 - Introduction To Calculus

Credit Hours: 3.00. A survey of differential and integral calculus. Applications to the agricultural, life, managerial, and social sciences. Not available for credit toward graduation in the School of Science. Typically offered Fall Spring.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

EDCI 20500 - Exploring Teaching As A Career

Credit Hours: 3.00. Students will become familiar with the work of teachers and begin to develop their educational philosophies through examining what it means to teach and to learn and the nature and purpose of schools. Students will critically evaluate teaching as their chosen profession. This course includes a required weekly field-based experience in an elementary, middle, or high school classroom. Typically offered Fall Spring.

EDCI 27000 - Introduction To Educational Technology And Computing

Credit Hours: 3.00. Addresses fundamentals of educational technology, including the integration of instructional design, media, computers and related technologies within the classroom setting. Typically offered Fall Spring Summer.

EDCI 28500 - Multiculturalism And Education

Credit Hours: 3.00. This course integrates an understanding of multiculturalism with principles of democratic education. Historical, sociological, cultural, political, philosophical, and pedagogical foundations of multiculturalism are explored and related to issues of pedagogy in a pluralistic society. This course is taken concurrently with EDCI 20500, which includes a school-based Theory into Practice field experience. Some discussion topics and assignments will be based on that field experience. It is highly recommended that EDCI 27000 be taken with or before taking this course. Typically offered Fall Spring Summer.

EDCI 49800 - Supervised Teaching

Credit Hours: 8.00 to 16.00. Teaching full time in a school classroom under the supervision of the teacher in charge of the class and a University supervisor. Completion of education methods courses and other Gate requirements for the major area and admittance to teacher education required. Typically offered Fall Spring Summer.

EDST 20010 - Educational Policies And Laws

Credit Hours: 1.00 to 3.00. The interactive course will provide an understanding of the history of schooling in the United States. A special emphasis will be placed on reviewing historical and contemporary educational policies and educational laws as each subject is critical to understanding social, historical, and cultural issues in the United States. Focus will also be on contemporary applications of historical ideas in the classroom and in school systems. Typically offered Fall Spring.

EDPS 23500 - Learning And Motivation

Credit Hours: 3.00. Introduction to concepts of learning and motivation in educational contexts (i.e., Educational Psychology). Influence of development, culture, and individual differences on learning and motivation. Uses of assessment and technology in promoting learning and motivation. A field-based experiential component is included. Typically offered Fall Spring Summer.

EDPS 26500 - The Inclusive Classroom

Credit Hours: 3.00. Characteristics of students with special needs/talents; strategies for helping students learn and develop in general educational settings. Emphasis placed upon research evidence, case studies, problem-based learning, and development of a plan for an inclusive classroom. A field-based component is included. Typically offered Spring Summer Fall.

EDPS 32700 - Assessment Literacy

Credit Hours: 1.00 to 3.00. Evaluating the impact of instruction on student performance is one of the most important skills for an educator. Effective teachers ask themselves, "How do I know if students are truly learning? Are they meeting educational objectives in the content area?" Using well-chosen assessment approaches, teachers can address these questions. In this course,

students will acquire assessment literacy: the ability to gather accurate information about student achievement, and use that information to make instructional decisions that will improve learning. Course activities will focus on assessment tasks relevant to P- 12 classroom settings. Typically offered Fall Spring.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures

emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

- Technical Agriculture Selective - Credit Hours: 15.00

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website or click here.

128 semester credits required for Bachelor of Science degree

There are GPA requirements for stage-gates in this degree

College of Agriculture & University Level Requirements

- 2.0 GPA required for Bachelor of Science degree
- 32 Upper division credits taken from Purdue
- 9 credits International Understanding
- 3 credits Multicultural Awareness
- 9 credits of Hum and/or Social Sciences outside the College of Agriculture

Program Requirements

Fall 1st Year

AGR 10100 - Introduction To The College Of Agriculture And Purdue University

Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall.

AGR 12100 - Introduction To Youth Development And Agricultural Education Academic Programs

Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Youth Development and Agricultural Education which includes Agricultural Communication and Agricultural Education. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8. Typically offered Fall.

ANSC 10200 - Introduction To Animal Agriculture

Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. This course is required for ANSC majors classified as Freshman and Sophomores. Typically offered Fall Spring.

EDCI 27000 - Introduction To Educational Technology And Computing

Credit Hours: 3.00. Addresses fundamentals of educational technology, including the integration of instructional design, media, computers and related technologies within the classroom setting. Typically offered Fall Spring Summer.

HORT 10100 - Fundamentals Of Horticulture

Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

- Biological Science Selective - Credit Hours: 4.00

14 Credits

Spring 1st Year

AGEC 21700 - Economics

Credit Hours: 3.00. National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems. Typically offered Fall Spring Summer.

COM 11400 - Fundamentals Of Speech Communication

Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400. CTL:ICM 1103 Fundamentals Of Public Speaking

COM 21700 - Science Writing And Presentation

Credit Hours: 3.00. Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences. Typically offered Fall Spring.

ENGL 10600 - First-Year Composition

Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer. NOTE: Concurrent registration is not permitted for ENGL 10600 and COM 11400.

FNR 10300 - Introduction To Environmental Conservation

Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

- Biological Science Selective - Credit Hours: 4.00

17 Credits

Fall 2nd Year

CHM 11100 - General Chemistry

Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

EDCI 20500 - Exploring Teaching As A Career

Credit Hours: 3.00. Students will become familiar with the work of teachers and begin to develop their educational philosophies through examining what it means to teach and to learn and the nature and purpose of schools. Students will critically evaluate teaching as their chosen profession. This course includes a required weekly field-based experience in an elementary, middle, or high school classroom. Typically offered Fall Spring.

EDCI 28500 - Multiculturalism And Education

Credit Hours: 3.00. This course integrates an understanding of multiculturalism with principles of democratic education. Historical, sociological, cultural, political, philosophical, and pedagogical foundations of multiculturalism are explored and related to issues of pedagogy in a pluralistic society. This course is taken concurrently with EDCI 20500, which includes a school-based Theory into Practice field experience. Some discussion topics and assignments will be based on that field experience. It is highly recommended that EDCI 27000 be taken with or before taking this course. Typically offered Fall Spring Summer.

- Technical Agriculture Selective - Credit Hours: 3.00

MA 15800 - Precalculus- Functions And Trigonometry

Credit Hours: 3.00. Functions, Trigonometry, and Algebra of calculus topics designed to fully prepare students for all first semester calculus courses. Functions topics include Quadratic, Higher Order Polynomials, Rational, Exponential, Logarithmic, and Trigonometric. Other focuses include graphing of functions and solving application problems. Not Available for credit toward graduation in the College of Science. Students may not receive credit for both MA 15400 and MA 15800. Students may not receive credit for both MA 15900 and MA 15800. Typically offered Fall Spring Summer.

- ASM 1XXXX Welding (transfer credits) - Credit Hours: 3.00

18 Credits

Spring 2nd Year

CHM 11200 - General Chemistry

Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring.

EDPS 23500 - Learning And Motivation

Credit Hours: 3.00. Introduction to concepts of learning and motivation in educational contexts (i.e., Educational Psychology). Influence of development, culture, and individual differences on learning and motivation. Uses of assessment and technology in promoting learning and motivation. A field-based experiential component is included. Typically offered Fall Spring Summer.

EDPS 26500 - The Inclusive Classroom

Credit Hours: 3.00. Characteristics of students with special needs/talents; strategies for helping students learn and develop in general educational settings. Emphasis placed upon research evidence, case studies, problem-based learning, and development of a plan for an inclusive classroom. A field-based component is included. Typically offered Spring Summer Fall.

ENTM 20600 - General Entomology

Credit Hours: 2.00. A general course on insect structure, function, biology, ecology and population management. Coordinated with the ENTM 20700 laboratory as an introductory course in entomology. Typically offered Fall Spring.

ENTM 20700 - General Entomology Laboratory

Credit Hours: 1.00. Laboratory exercises parallel topics presented in ENTM 20600. Insect structures and function are studied as a basis for learning to identify insects and other arthropods. Typically offered Fall Spring.

HORT 20100 - Plant Propagation

Credit Hours: 3.00. Theoretical and applied aspects of controlled plant reproduction by sexual and asexual techniques, including seeds, grafting and budding, layering, cuttings, micropropagation (in vitro culture), and specialized structures. Lectures emphasize morphological changes and physiological processes involved in plant propagation. Laboratory exercises illustrate the practical applications of propagation techniques. Typically offered Spring.

AGEC 31000 - Farm Organization

Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Spring.

AGEC 33000 - Management Methods For Agricultural Business

Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring.

18 Credits

Fall 3rd Year

AGRY 25500 - Soil Science

Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 32000 - Genetics

Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring.

ASM 20100 - Construction And Maintenance

Credit Hours: 3.00. Fundamental principles in the selection and use of tools for the construction and maintenance of agricultural and related facilities, equipment, and machines. Areas covered include small engines, concrete and masonry, wood, plumbing, electricity, and metal. Typically offered Fall Spring.

EDPS 32700 - Assessment Literacy

Credit Hours: 1.00 to 3.00. Evaluating the impact of instruction on student performance is one of the most important skills for an educator. Effective teachers ask themselves, "How do I know if students are truly learning? Are they meeting educational objectives in the content area?" Using well-chosen assessment approaches, teachers can address these questions. In this course, students will acquire assessment literacy: the ability to gather accurate information about student achievement, and use that information to make instructional decisions that will improve learning. Course activities will focus on assessment tasks relevant to P- 12 classroom settings. Typically offered Fall Spring.

Credit Hours: 2.00

EDST 20010 - Educational Policies And Laws

Credit Hours: 1.00 to 3.00. The interactive course will provide an understanding of the history of schooling in the United States. A special emphasis will be placed on reviewing historical and contemporary educational policies and educational laws as each subject is critical to understanding social, historical, and cultural issues in the United States. Focus will also be on contemporary applications of historical ideas in the classroom and in school systems. Typically offered Fall Spring.

Credit Hours: 1.00

YDAE 31800 - Coordination Of Supervised Agricultural Experience Programs

Credit Hours: 3.00. Record keeping and supervisory skills needed to advise and coordinate supervised agricultural experience programs for secondary agricultural science and business students. Integration of supervised agricultural experiences with programming in youth organizations and classroom instruction for secondary agricultural science and business classrooms. Typically offered Fall.

- Technical Agriculture Selective - Credit Hours: 3.00

18 Credits

Spring 3rd Year

AGRY 37500 - Crop Production Systems

Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

ANSC 22100 - Principles Of Animal Nutrition

Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring.

YDAE 31900 - Planning Agricultural Science And Business Programs

Credit Hours: 3.00. Development of course content plans that coordinate and utilize agricultural science and business, community resources, FFA, and supervised agricultural experience programs. Typically offered Spring.

YDAE 44100 - Field Experience In Agricultural Education Programs

Credit Hours: 1.00 to 3.00. Field experience in agricultural science and business programs to include observation and participation in the teaching process and program development activities. Typically offered Fall Spring.

- Humanities or Social Science Selective (30000+ level) - Credit Hours: 3.00
- Technical Agriculture Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

FS 16100 - Science Of Food

Credit Hours: 3.00. Chemical and physical properties of foods; issues pertaining to safety, food-diet-health relationship; government regulations pertaining to food safety, quality and additives; preservation techniques and transformation of agricultural commodities to food products; Food facts, myths, and practices that are important for making intelligent food decisions. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Food Science. Typically offered Fall.

STAT 30100 - Elementary Statistical Methods

Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, 35000, 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.

YDAE 44000 - Methods Of Teaching Agricultural Education

Credit Hours: 3.00. Principles and procedures for teaching agricultural science and business in public schools. Must be admitted to teacher education program. Typically offered Fall.

- Technical Agriculture Selective - Credit Hours: 6.00

15 Credits

Spring 4th Year

EDCI 49800 - Supervised Teaching

Credit Hours: 8.00 to 16.00. Teaching full time in a school classroom under the supervision of the teacher in charge of the class and a University supervisor. Completion of education methods courses and other Gate requirements for the major area and admittance to teacher education required. Typically offered Fall Spring Summer.

12 Credits

Note

128 semester credits required for Bachelor of Science degree.

2.5 GPA required for Bachelor of Science degree.

Consultation with an advisor may result in an altered plan customized for an individual student.

Foreign Language Courses

Foreign Language proficiency requirements vary by program. For acceptable languages and proficiency levels, see your advisor:

American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.