

# College of Science

## College of Science

### Overview

#### Dean's Welcome

You probably already know that you are about to embark on one of the most exciting stages in your life! As you are making your college decision, I'd like to share some of the things that our students have told us they appreciate:

- We represent seven departments with internationally renowned faculty, world-class facilities, and an outstanding history of producing both academic and industry scientists with an impressive 90 percent graduate placement rate within six months (average rate since 2006 commencement). Our knowledgeable and friendly faculty, staff and academic advisors will help you discover your strengths and guide you to graduation and beyond;
- Our coursework prepares you for a broad range of careers, graduate education, and professional schools such as medicine, law, and business;
- You will develop leadership, teamwork, and communication skills by working with an incredibly broad range of fellow Boilermakers - in class and in student organizations;
- You will begin with courses in your major immediately, taught by faculty who are experts in their fields;
- You will have the opportunity to participate in cutting-edge research with faculty as early as your freshman year;
- There are more than 35 career fairs on campus attended by hundreds of companies that come to Purdue to interview students for internships and permanent positions; Purdue ranks fourth by corporate recruiters in preparing students for the work force.
- Be sure to take advantage of personalized academic and career counseling.

Since there's no substitute for experience, our recruiting office can help you plan a visit to campus where you can shadow a student, interact with current science students for the "inside scoop," or meet with faculty in your field. Any of our staff are always available to answer questions that you or your parents may have.

For more information, call (765) 494-1990, or e-mail to: [ScienceRecruiting@purdue.edu](mailto:ScienceRecruiting@purdue.edu).

#### Go Boilers!

Sincerely,  
Jeff Roberts, Dean

## Admissions

<http://www.admissions.purdue.edu/majors/colleges.php?ClgCd=SCI>

## Admission to Teacher Education

2014-15 Teacher Education Program Timeline

# Advising

## Seeing a College of Science Academic Advisor

College of Science students are assigned to an academic advisor in their department who will be their guide and support them as they:

- identify academic, personal and career aspirations that set the foundation for a successful undergraduate experience and future graduate and/or professional life.
- develop a four-year plan of study that meets their curricular, co-curricular and extracurricular goals.
- identify campus and community resources that support personal well-being, academic success and the development of professional skills.
- develop realistic semester-by-semester course plans that result in high academic performance and on-time degree progression.
- understand university and college policies and how they mold and impact their university experience.

Students are encouraged to stay in frequent contact with their advisors throughout their time in the College of Science. Contact information may be found at CoS Advising Offices. [Make An Advising Appointment](#)

## Advising Appointment Options

### Scheduled Advising Appointments

Students may schedule 30-minute appointments with their assigned advisors:

- to register for Fall/Spring semesters, Summer terms
- for in-depth advising questions
- for academic/degree planning, graduate/professional school planning and career development
- to discuss and receive support in addressing personal and academic challenges
- for general questions and concerns

Students must be on time for their scheduled appointments. Late arrivals of more than 5 minutes may result in a cancellation of your appointment.

Make an Appointment with your advisor

### Walk-in Appointments

Walk-in appointments may be used to drop/add courses, resolve scheduling conflicts, complete paperwork, and to address time-sensitive questions. Appointments are kept to 15 minutes and may not be used for registration or degree planning purposes.

Walk-in appointments are scheduled on a first come, first served basis and therefore, students are not guaranteed to see their advisor during scheduled walk-in times if the number of students to be seen is greater than the time that has been scheduled.

Students may see their assigned advisor only unless their advisor is not available and there is an immediate need. Before visiting your advising office for a walk-in appointment, check walk-in times. Times are updated the Friday before the following week.

Note: walk-in times **ARE** subject to change without notice.

### CODO Walk-in Appointments

Students who would like to CODO to the College of Science should consult the Non-College of Science Walk-in Schedule and review College of Science CODO requirements for their intended program before speaking with a Science advisor.

# Advising Policy for Students Who Will Pursue a non-College of Science Program

## Two Semester Advising Policy:

Students who enter the College of Science with immediate plans to pursue a non-science academic program are eligible to receive two semesters of academic advising and PIN releases as they work towards a successful CODO to their intended program. If CODO requirements are not met by the end of their first year, students will be required to request a CODO to the College of Liberal Arts while they continue to pursue their degree goals.

## Four Semester Advising Policy:

Students who pursue a College of Science curriculum but who later determine that they would like to pursue an alternate program outside of the College will have four semesters to successfully CODO. A request may be made for approval of the 5th Semester Advising Policy if a student is close to meeting CODO requirements and has provided course recommendations from an advisor in their intended program.

## Contact Information

### Mailing address:

Purdue University College of Science  
150 N. University St  
West Lafayette, IN 47907

### Directories

- Science Administration
- Office of Undergraduate Education
- Departments
- Science IT

### Phone and Fax:

Student Advising Office

- 765-494-1771 (office)
- 765-496-3015 (fax)

Science Administration

- 765-494-1729 (office)
- 765-494-1736 (fax)

Science IT Helpline

- 765-494-4488

## College of Science Administration

## About the Department of Science Administration

The interdisciplinary science major is designed to provide College of Science students with a broad base in the sciences. By combining a primary area of science study, an interdisciplinary science core, a supporting area of academic interest and the core curriculum shared by all College of Science programs, students explore how the disciplines of science come together to identify and solve scientific challenges. Students customize the major by selecting a departmental or interdepartmental primary area based in science and a supporting area that complements or enhances the primary area. This supporting area may be an approved minor from any college or school at the University or a concentration of 18 credits of courses with a unifying theme. There is a primary area representing each department in the College of Science, however, cross-disciplinary areas may be explored and added as appropriate. With the help of either a faculty member or an academic advisor, students are encouraged to petition for approval of their supporting area.

Students completing the interdisciplinary science major have gone on to a variety of careers - some in, and others out of, the world of science. These careers include medicine, law and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

The most recent information is available at the College of Science website.

## Faculty

<http://www.science.purdue.edu/faculty-and-staff/directory.php>

## Contact Information

### Mailing address:

Purdue University College of Science  
150 N. University St  
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Science IT Helpline

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### Contact Individual College of Science Groups:

- Advising - email
- Graduate Education and International Programs - email
- Dean's Office - email
  - Speech/Appearance request form

- Research - email
- Academic Affairs - email
- Undergraduate Education - email
- Science Diversity - email
- Strategic Relations - email
- Recruiting - email
- K-12 Outreach - email
- Special Events & Alumni Relations - email
- Science Advancement - email
- Science IT - email

## **Baccalaureate**

# **Interdisciplinary Science, BS**

## **About the Program**

The interdisciplinary science major is designed to provide College of Science students with a broad base in the sciences. By combining a primary area of science study, an interdisciplinary science core, a supporting area of academic interest and the core curriculum shared by all College of Science programs, students explore how the disciplines of science come together to identify and solve scientific challenges. Students customize the major by selecting a departmental or interdepartmental primary area based in science and a supporting area that complements or enhances the primary area. This supporting area may be an approved minor from any college or school at the University or a concentration of 18 credits of courses with a unifying theme. There is a primary area representing each department in the College of Science, however, cross-disciplinary areas may be explored and added as appropriate. With the help of either a faculty member or an academic advisor, students are encouraged to petition for approval of their supporting area.

Students completing the interdisciplinary science major have gone on to a variety of careers - some in, and others out of, the world of science. These careers include medicine, law and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

The most recent information is available at the College of Science website.

The Interdisciplinary Science Major is designed to give a student a broad base in the sciences with more depth in a Primary Area of Science and a Supporting Area, usually outside of Science. The Core courses are common across the major but the student customizes the major by selecting a departmental or interdepartmental Primary Area based in Science and a Supporting Area which may come from any college or school at the University. There is a Primary Area representing each department in the College of Science and cross-disciplinary areas will be explored and added as appropriate. Several Supporting Areas will be suggested and a student may petition for approval of others.

### **Summary of Program Requirements**

The Summary of Program Requirements for Interdisciplinary Science is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

## Interdisciplinary Core (38-48 credits)

(COMPLETE THIS SECTION)

- BIOL 11000 - Fundamentals Of Biology I
- BIOL 11100 - Fundamentals Of Biology II  
or
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- BIOL 13500 - First year Biology Laboratory
  
- CHM 11500 - General Chemistry
- CHM 11600 - General Chemistry  
or
- CHM 12500 - Introduction To Chemistry I
- CHM 12600 - Introduction To Chemistry II
  
- CS 15800 - C Programming or
- CS 15900 - Programming Applications For Engineers or
- CS 17700 - Programming With Multimedia Objects or
- CS 18000 - Problem Solving And Object-Oriented Programming
  
- EAS 10000 - Credit Hours: 3.00 - 4.00  
or
- EAS 10900 - Credit Hours: 3.00 - 4.00 or
- EAS 19100 - Credit Hours: 3.00 - 4.00  
or
- EAS 11100 - Credit Hours: 3.00 - 4.00  
or
- EAS 22100 - Credit Hours: 3.00 - 4.00 or
- EAS 22500 - Credit Hours: 3.00 - 4.00  
and
- EAS 23000 - Credit Hours: 3.00 - 4.00
  
- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16200 - Plane Analytic Geometry And Calculus II  
or
- MA 16500 - Analytic Geometry And Calculus I
- MA 16600 - Analytic Geometry And Calculus II  
or
- MA 22300 - Introductory Analysis I
- MA 22400 - Introductory Analysis II  
or
- MA 23100
- MA 23200
  
- PHYS 17200 - Modern Mechanics

and

- PHYS 27200 - Electric And Magnetic Interactions or
- PHYS 24100 - Electricity And Optics or
- PHYS 25200 - Electricity And Optics Laboratory  
or
- PHYS 22000 - General Physics and
- PHYS 22100 - General Physics
  
- STAT 35000 - Introduction To Statistics or
- STAT 50300 - Statistical Methods For Biology or
- STAT 51100 - Statistical Methods

## Plus a Primary Area (12-17 credits)

(You Must Choose One)

Other Primary Areas that cross departments within the College of Science may be added as they are developed and approved.

## Biological Sciences (15-17 credits)

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
  
- BIOL 32800 - Principles Of Physiology (Macromolecules)
- BIOL 36600 (Macromolecules)
- BIOL 39500 - Special Assignments (Macromolecules)  
or
- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology

## Chemistry (16 credits)

- CHM 25500 - Organic Chemistry
- CHM 25501 - Organic Chemistry Laboratory
- CHM 25600 - Organic Chemistry
- CHM 25601 - Organic Chemistry Laboratory  
or
- CHM 26505 - Organic Chemistry
- CHM 26300 - Organic Chemistry Laboratory
- CHM 26605 - Organic Chemistry
- CHM 26400 - Organic Chemistry Laboratory
  
- CHM 24100 - Introductory Inorganic Chemistry

- CHM 37200 - Physical Chemistry

## Computer Science (16 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I required in Core. or
- MA 16200 - Plane Analytic Geometry And Calculus II required in Core.
- CS 18000 - Problem Solving And Object-Oriented Programming required in Core.
- CS 18200 - Foundations Of Computer Science
- CS 24000 - Programming In C
- CS 25000 - Computer Architecture
- CS 25100 - Data Structures And Algorithms
- CS elective at or above 30000 level - Credit Hours: 3.00

## Earth & Atmospheric Science (15-16 credits)

# Whichever is not taken in the core.

- EAPS 11100 - Credit Hours: 3.00 or equivalent # or
- EAPS 22100 - Credit Hours: 4.00 # or
- EAPS 22500 - Credit Hours: 4.00 #
- and
- EAPS 23000 - Credit Hours: 4.00 #
- 
- EAPS 11200 - or any EAS course at or above 20000 level - Credit Hours: 3.00

## Mathematics (16-17 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I required in Core. or
- MA 16200 - Plane Analytic Geometry And Calculus II required in Core.
- MA 26100 - Multivariate Calculus or
- MA 27100 - Several Variable Calculus
- MA 36600 - Ordinary Differential Equations or
- MA 26200 - Linear Algebra And Differential Equations
- MA 35100 - Elementary Linear Algebra
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors or
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- MA elective at or above 30000 level - Credit Hours: 3.00



## Physics (13-14 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I required in Core. or
- MA 16200 - Plane Analytic Geometry And Calculus II required in Core.
  
- PHYS 17200 - Modern Mechanics required in Core.  
and
- PHYS 27200 - Electric And Magnetic Interactions required in Core. or
- PHYS 24100 - Electricity And Optics required in Core. or
- PHYS 25200 - Electricity And Optics Laboratory required in Core.
  
- MA 26100 - Multivariate Calculus
  
- PHYS 34200 - Modern Physics or
- PHYS 34400 - Modern Physics
  
- PHYS elective at or above 30000 level - Credit Hours: 3.00
- PHYS elective at or above 30000 level - Credit Hours: 3.00

## Statistics (12-13 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I required in Core. or
- MA 16200 - Plane Analytic Geometry And Calculus II required in Core.
  
- STAT 51200 - Applied Regression Analysis
  
- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments
  
- STAT 22500 - Introduction To Probability Models or
- STAT 31100 - Introductory Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
  
- STAT 41700 - Statistical Theory or
- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments or
- MA 26100 - Multivariate Calculus

## Environmental Biology (17 credits)

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 48300 - Great Issues: Environmental And Conservation Biology

- BIOL 58500 - Ecology
- BIOL 32800 - Principles Of Physiology (Macromolecules) or
- BIOL 36600 (Macromolecules) or
- BIOL 39500 - Special Assignments (Macromolecules)  
or
- BIOL 43800 - General Microbiology and
- BIOL 43900 - Laboratory In General Microbiology

## Note

**Supporting Area** courses may not overlap Core or Primary Area courses but may overlap the General Education Area. The Supporting Area may be built on the numerous minors available to Science students or on any coherent grouping of courses with a central unifying theme. These might include preprofessional, scientific writing, sales, forensics, technical studies, international studies, science policy, ethics, women's studies, African-American studies, etc. The possibilities are very broad but any plan must be approved by the College of Science dean or designee.

## Supporting Area (18 credit)

(COMPLETE THIS SECTION)

### Supporting Area Example for Environmental Biology (18 credits)

Other courses may be used upon approval.

- POL 42900 - Contemporary Political Problems
- CE 35000 - Introduction To Environmental And Ecological Engineering
- FNR 48800 - Global Environmental Issues
- PHIL 29000 - Environmental Ethics
- POL 52300 - Environmental Politics And Public Policy
- POL 52000 - Special Topics In Public Policy

## College Of Science Core Requirements (30-44 credits)

(COMPLETE THIS SECTION)

### Writing, Communication, Teamwork (6-11 credits)

- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Teamwork: Theory & Experience - Credit Hours: 1.00
- Technical Writing - Credit Hours: 2.00 - 3.00
- Technical Presentation - Credit Hours: 0.00 - 3.00

## Language and Culture (9-12 credits)

A passing letter grade (not P/N) in a second-semester language and an additional language, culture, or diversity class. If you are an international student, see your advisor for guidelines.

## General Education (9 credits)

9 credits of courses including a two course sequence in Social Studies or Humanities.

## Great Issues (3 credits)

## Multidisciplinary Experience (3-9 credits)

## College Of Science Requirements

For graduation, you must total 124 credit hours, 32 credits 300 level and above residency requirement, with a 2.0 or above cumulative GPA.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Certificate

## Learning Beyond the Classroom Certificate

Learning Beyond the Classroom (LBC) is open only to students majoring in the College of Science. It is a voluntary program aimed at encouraging you, the College of Science student, to engage in activities that provide hands-on experience and

opportunities to apply classroom knowledge. Successful completion of the LBC program will be noted on your official Purdue transcript. You will also receive a certificate of completion.

Participation in LBC involves attending, organizing, or leading activities that fall into three general categories: career and professional development; service, citizenship and leadership; and experience with domestic and international diversity. Progress in each of the three areas is tracked by a point system. Points are earned by submitting reports on participation in activities. The number of points earned varies with the intensity of the activity.

Completing the LBC certificate requires that you:

- Participate in at least one intensive activity lasting an extended period of time, such as semester-long study abroad, full-time summer internship, two (consecutive) semesters of undergraduate research and academic year resident assistant. Such an activity is worth 10 points.
- Accumulate a total of 24 points, with at least 4 points in each of 3 categories.
- Include either (a) 3 credits of approved coursework with grades of P or C- or higher (one or more courses totaling 3 credits can meet this requirement) or (b) a semester-long study abroad program (worth 10 points) or some combination of spring break (4 points) and/or summer study abroad activities (6 points), totaling 10 points.

In most cases, a maximum of 6 points per year and 10 points in total may be earned for any particular activity. It is estimated that completion of the certificate will take approximately 30 hours over your college career in addition to the intense 10-point activity described above.

[http://science.purdue.edu/Current\\_Students/learning-beyond-the-classroom/details.html](http://science.purdue.edu/Current_Students/learning-beyond-the-classroom/details.html)

## Department of Biological Sciences

### About the Biological Sciences Program

Discovery. This word captures our purpose, commitment, and vision. As a leading department in a major research university, our mission is to effectively integrate learning, discovery, and engagement. The best learning is experiential, and leads to a clear understanding of how discoveries are made, how science is conducted, and how ideas are communicated. The best learning is facilitated by faculty who are active in research and who can engage students in the excitement of biology. And the best learning results in alumni who are well-prepared to successfully pursue their chosen careers.

As we discover the many facets of biocomplexity, from vast ecosystems to the structure and function of individual molecules, we remain committed to our mission. Our faculty, staff, and students are engaged with the communities of science and education, the worlds of industry and business, and our alumni and friends. To each individual who joins us, we promise opportunities to experience the excitement of discovery in biology. We encourage you to become a part of our team-as a student, alumnus, corporate partner, scientific collaborator, or a member of our faculty and staff. Join us on our journey of learning, discovery, and engagement. Discover Biology at Purdue!

### Faculty

<https://www.bio.purdue.edu/People/faculty/index.php>

### Contact Information

The Department of Biological Sciences address is:  
915 W. State Street West Lafayette, IN 47907-2054

## **Main Office**

**Contact person:** Amanda Jenkins

Phone Number: (765) 494-4408

Fax No. is: (765) 494-0876

# **Graduate Information**

For Graduate Information please see Biological Sciences Graduate Program Information.

## **Baccalaureate**

# **Biochemistry (Biology), BS**

## **About the Program**

Biochemistry investigates the chemical and molecular foundations of life processes. A student may study the transfer of genetic information into biological structures, the conversion of nutrients into cell constituents and their utilization as sources of energy, the storage of memory, and the chemical nature of neural processes. Laboratory techniques include electrophoresis, chromatography, Western blotting, protein sequence analysis, and peptide mapping. Understanding the development and application of enzymatic assays is fundamental to this field of study. This rigorous curriculum is excellent preparation for a number of careers in both academic and industrial research, including cancer and AIDS research, medicine, veterinary medicine, dentistry, structural biology, genetics, and medicinal chemistry and drug development.

Biochemistry (Biology) Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Biochemistry (Biology) is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-BIBI  
120 Credits

## **Departmental/Program Major Courses (40-47 credits)**

\*A 2.0 average is required in these courses

## \*Required Major Courses (39 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 39500 - Special Assignments (Req #9)
- BIOL 41500 - Introduction To Molecular Biology (Req #10)
- BIOL 42000 - Eukaryotic Cell Biology (Req #11)
- BIOL 44201 - Introductory Module: Protein Expression (Req #14)
- BIOL 59500 - Special Assignments (Req #12)
- BCHM 56100 - General Biochemistry I (Req #16)
- BCHM 56200 - General Biochemistry II (Req #17)

## \*Biology Selectives - Select course for each requirement (4-7 credits)

- Biology Lab Selective (Req #15) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req #15) - Credit Hours: 1.00 - 2.00
- Biology Selective (Req #13) - Credit Hours: 2.00 - 3.00

## Other Departmental /Program Course Requirements (70-82 credits)

- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00

- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

### General CHM 1 Selective (0-4 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) General Chemistry (satisfies Science Selective for core)

### General CHM 2 Selective (4-5 credits)

- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus

### Analytical Chemistry Selective - Select from (3-4 credits)

- BCHM 22100 - Analytical Biochemistry or
- CHM 22400 - Introductory Quantitative Analysis or
- CHM 32100 - Analytical Chemistry I

### Physical Chemistry Selective - Select from (4-6 credits)

- CHM 37200 - Physical Chemistry  
or
- CHM 37300 - Physical Chemistry and
- CHM 37400 - Physical Chemistry

### PHYS 1 Selective - Select from (4 credits)

(satisfies Science Selective for core)

- PHYS 23300 - Physics For Life Sciences I or
- PHYS 17200 - Modern Mechanics

### PHYS 2 Selective - Select from (4 credits)

- PHYS 23400 or
- PHYS 27200 - Electric And Magnetic Interactions

## Calculus 1 Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (4-5 credits)

- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (0-10 credits)

### 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

### Program Requirements

(Beginning with CHM 11500 in fall)

#### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 4.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

#### 17-18 Credits



## Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 17-19 Credits

## Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

## Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

## Fall 3rd Year

- BCHM 56100 - General Biochemistry I (Req #16)
- BIOL 39500 - Special Assignments (Req #9)
- BIOL 41500 - Introduction To Molecular Biology (Req #10)
- PHYS 1 Selective - Credit Hours: 4.00

- General Education 2 Selective - Credit Hours: 3.00

## 16 Credits

### Spring 3rd Year

- BCHM 56200 - General Biochemistry II (Req #17)
- PHYS 2 Selective - Credit Hours: 4.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

## 14-15 Credits

### Fall 4th Year

- BIOL 42000 - Eukaryotic Cell Biology (Req #11)
- BIOL 59500 - Special Assignments (Meth & Meas in Physical Biochem) (Req #12)
- Analytical Chemistry Selective - Credit Hours: 3.00 - 4.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Biology Selective (Req #13) - Credit Hours: 2.00 - 3.00

## 12-16 Credits

### Spring 4th Year

- Physical Chemistry Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Great Issues Selective - Credit Hours: 3.00
- BIOL 44201 - Introductory Module: Protein Expression (Req #14)
- Biology Lab Selective (Req #15) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req #15) - Credit Hours: 1.00 - 2.00

## 14 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Biochemistry Honors, BS

## About the Program

Biochemistry investigates the chemical and molecular foundations of life processes. A student may study the transfer of genetic information into biological structures, the conversion of nutrients into cell constituents and their utilization as sources of energy, the storage of memory, and the chemical nature of neural processes. Laboratory techniques include electrophoresis, chromatography, Western blotting, protein sequence analysis, and peptide mapping. Understanding the development and application of enzymatic assays is fundamental to this field of study. This rigorous curriculum is excellent preparation for a number of careers in both academic and industrial research, including cancer and AIDS research, medicine, veterinary medicine, dentistry, structural biology, genetics, and medicinal chemistry and drug development.

Biochemistry (Biology) Website

### Summary of Program Requirements

The Summary of Program Requirements for Biochemistry (Honors) is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

## Departmental/Program Major Courses (43-46 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (39 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 39500 - Special Assignments
- BIOL 41500 - Introduction To Molecular Biology
- BIOL 42000 - Eukaryotic Cell Biology
- BIOL 44201 - Introductory Module: Protein Expression
- BIOL 59500 - Special Assignments
- BCHM 56100 - General Biochemistry I
- BCHM 56200 - General Biochemistry II

### \*Major Selectives - Select course for each requirement (4-7 credits)

- Biology Lab Selective LINK 1 - Credit Hours: 1.00 - 2.00
- Biology Lab Selective LINK 1 - Credit Hours: 1.00 - 2.00
- Biology Selective LINK 2 - Credit Hours: 2.00 - 3.00

### Other Departmental /Program Course Requirements (71-84 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) General Chemistry (satisfies Science Selective for core)
  
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM I Selective - Credit Hours: 4.00

- Organic CHM 2 Selective - Credit Hours: 4.00
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
- PHYS 27200 - Electric And Magnetic Interactions
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

### Analytical Chemistry Selective - Select from (0-4 credits)

- BCHM 22100 - Analytical Biochemistry or
- CHM 22400 - Introductory Quantitative Analysis or
- CHM 32100 - Analytical Chemistry I

### Physical Chemistry Selective - Select from (0-6 credits)

- CHM 37200 - Physical Chemistry  
or
- CHM 37300 - Physical Chemistry and
- CHM 37400 - Physical Chemistry

### Biochemistry Honors Selective (4-6 credits)

- CHM 32100 - Analytical Chemistry I  
or
- CHM 37300 - Physical Chemistry and
- CHM 37400 - Physical Chemistry

### Calculus 1 Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (4-5 credits)

- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (0-6 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 4.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 17-18 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  - CHM 11600 - General Chemistry
  - Calculus II Selective - Credit Hours: 4.00 - 5.00
  - Language/Culture 2 Selective - Credit Hours: 3.00
- 
- ENGL 10600 - First-Year Composition or
  - ENGL 10800 - Accelerated First-Year Composition

## 17-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 3rd Year

- BCHM 56100 - General Biochemistry I
- BIOL 39500 - Special Assignments
- BIOL 41500 - Introduction To Molecular Biology
- PHYS 17200 - Modern Mechanics
- General Education 2 Selective - Credit Hours: 3.00

## 16 Credits

## Spring 3rd Year

- BCHM 56200 - General Biochemistry II
- PHYS 27200 - Electric And Magnetic Interactions
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

## 14-15 Credits

## Fall 4th Year

- BIOL 42000 - Eukaryotic Cell Biology
- BIOL 59500 - Special Assignments (Meth & Meas in Physical Biochem)
- Analytical Chemistry Selective - Credit Hours: 3.00 - 4.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Biology Selective - Credit Hours: 2.00 - 3.00

## 12-16 Credits

## Spring 4th Year

- Physical Chemistry Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Great Issues Selective - Credit Hours: 3.00
- BIOL 44201 - Introductory Module: Protein Expression
- Biology Lab Selective - Credit Hours: 1.00 - 2.00
- Biology Lab Selective - Credit Hours: 1.00 - 2.00

## 14 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements



The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Biology Education, BS

# About the Program

A student completing the requirements in biology education is qualified to teach high school biology. Biology education majors are advised that it is wise to select an additional developmental area, such as middle school, and an additional content area, such as Physical Science or Chemistry.

Biology Education Website

### Summary of Program Requirements

The Summary of Program Requirements for Biology Education is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOL-EDUC-BS  
Code-BIED  
120 Credits

## Departmental/Program Major Courses (29 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (19 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution

### \*Biology Selectives (must total at least 10 credits)

One course may satisfy multiple requirements

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00 - 4.00
- Group A Selective (Req #10) - Credit Hours: 2.00 - 3.00
- Group B Selective (Req #10) - Credit Hours: 2.00 - 3.00
- 500 Level Biology Selective (Req #10) - Credit Hours: 3.00 - 4.00
- Biology Lab Selective (Req #10) - Credit Hours: 2.00 - 4.00

### Other Departmental /Program Course Requirements (xx-xx credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (may satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00

- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- EDCI 20500 - Exploring Teaching As A Career
- EDCI 28500 - Multiculturalism And Education (satisfies Human Cultures Humanities for core)
- EDPS 23500 - Learning And Motivation (satisfies Behavioral Social Sciences for core)
- EDPS 26500 - The Inclusive Classroom (satisfies Human Cultures Humanities for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 27000 - Introduction To Educational Technology And Computing (satisfies Information Literacy Selective for core)
- EDST 20000 - History And Philosophy Of Education (satisfies Human Cultures Humanities for core)
- EDCI 42100 - The Teaching Of Biology In Secondary Schools
- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 49800 - Supervised Teaching

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

## Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

## 15-17 Credits

## Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

## Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- EDCI 27000 - Introduction To Educational Technology And Computing
- EDCI 20500 - Exploring Teaching As A Career
- EDCI 28500 - Multiculturalism And Education

## 18 Credits

## Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- EDPS 23500 - Learning And Motivation
- EDPS 26500 - The Inclusive Classroom

## 18 Credits

### Fall 3rd Year

- Intermediate Biology Selective - Credit Hours: 3.00
- Group A Selective - Credit Hours: 2.00 - 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 1 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15-16 Credits

### Spring 3rd Year

- Group B Selective - Credit Hours: 3.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 2 Selective - Credit Hours: 3.00

## 14-15 Credits

### Fall 4th Year

- Biology Lab Selective(s) - Credit Hours: 2.00 - 4.00
- 500 Level Biology Selective - Credit Hours: 3.00
- STAT 50300 - Statistical Methods For Biology
- EDCI 42100 - The Teaching Of Biology In Secondary Schools
- Great Issues Selective - Credit Hours: 3.00

## 14-16 Credits

## Spring 4th Year

- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 49800 - Supervised Teaching

15 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.5 Biology Content Area gpa is required.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## **Biology, BS**

## **About the Program**

The Biology major allows a student to pursue a general curriculum with the bachelor of science as a terminal degree or as preparation for graduate work or professional school. This major is designed to give a student maximum flexibility in designing a plan of study suited to individual needs and interests. This curriculum is excellent preparation for a number of careers in both academic and industrial research and professions in medicine, dentistry, and veterinary medicine.

Biology Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Biology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-BIOL  
120 Credits

## **Departmental/Program Major Courses (34-35 credits)**

\*A 2.0 average is required in these courses

### **\*Required Major Courses (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution

### **\*Intermediate Biology Selective (3-4 credits)**

Select one; cannot also be used for Major Selectives below

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00 - 4.00

### **\*Biology Selectives (must total at least 12 credits)**

Can use one course for multiple requirements

- Group A Selective (Req #10) - Credit Hours: 2.00 - 3.00
- Group B Selective (Req #10) - Credit Hours: 2.00 - 3.00
- 500 Level Biology Selective (Req #10) - Credit Hours: 3.00 - 4.00
- Biology Lab Selective (Req #10) - Credit Hours: 2.00 - 4.00
- Biology Lab Selective (Req #10) - Credit Hours: 0.00 - 2.00
- Biology Selective (Req #10) - Credit Hours: 0.00 - 3.00

## Other Departmental /Program Course Requirements (63-79 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- Chemistry Selective - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (may satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (may satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I



## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (13-23 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 4.00

- Language/Culture 2 Selective - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 3rd Year

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00
- Group A Selective (Req #10) - Credit Hours: 2.00 - 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

## 15 Credits

### Spring 3rd Year

- Group B Selective (Req #10) - Credit Hours: 3.00
- Chemistry Selective - Credit Hours: 3.00 - 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- Biology Lab Selective(s) (Req #10) - Credit Hours: 2.00 - 4.00
- STAT 50300 - Statistical Methods For Biology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 4.00

## 13-18 Credits

### Spring 4th Year

- 500 Level Biology Selective (Req #10) - Credit Hours: 3.00
- Biology Selective (Req #10) - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

## 16 Credits

### Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

# Cell, Molecular, and Developmental Biology, BS

## About the Program

Understanding how eukaryotic cells process information from their environment and initiate programs of gene expression leading to growth, development, and functional specification is the essence of a cell, molecular, and developmental (CMD) biology major. Students enrolled in this curriculum will take courses providing a solid foundation in the molecular biology of cells and gain a full appreciation of how molecular complexes interact to make a cell function. This fundamental knowledge in cell and molecular biology will be applied through further coursework in genetics and developmental biology to examine how eukaryotic organisms function and how specific aspects of that function are perturbed by disease. Within the CMD major, students have the option of focusing their studies on animal systems, plant systems, or both. Graduates with a CMD major are well-prepared to pursue careers in academic or industrial research, biotechnology, genetic engineering, medicine, veterinary medicine, and other health-related professions.

Cell, Molecular, and Developmental Biology Website

### Summary of Program Requirements

The Summary of Program Requirements for Cell, Molecular, and Developmental Biology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-CMDB  
120 Credits

## Departmental/Program Major Courses (38-40 credits)

\*A 2.0 average is required in these courses

## \*Required Major Courses (21 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 44201 - Introductory Module: Protein Expression (Req # 11)

## \*Major Selectives - Select one course for each requirement (17-19 credits)

- Intermediate Requirement Selective (Req # 9) - Credit Hours: 3.00
- Cell/Molecular/Development Selective (Req # 10) - Credit Hours: 3.00
- Cell/Molecular/Development Selective (Req # 10) - Credit Hours: 3.00
- 500 Level Biology Selective (Req # 12) - Credit Hours: 3.00
- Biology Lab Selective (Req # 11) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req # 11) - Credit Hours: 1.00 - 2.00
- Biology Selective (Req # 13) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (65-79 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
  
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00

- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (may satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Chem Selective (3-4 credits)

- BCHM 56100 - General Biochemistry I or
- CHM 53300 - Introductory Biochemistry or
- CHM 33900 (plus 33901 if CHM 12901 is taken for gen chemistry)

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (1-17 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

### 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

### 15 Credits

## Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

15 Credits

## Fall 3rd Year

- Intermediate Requirement Selective (Req # 11) - Credit Hours: 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-16 Credits

## Spring 3rd Year

- Cell/Molecular/Developmental Selective (Req # 10) - Credit Hours: 3.00
- PHYS 2 Selective - Credit Hours: 4.00
- Chemistry Selective - Credit Hours: 3.00 - 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

17 Credits

## Fall 4th Year

- Cell/Molecular/Developmental Selective (Req # 10) - Credit Hours: 3.00
- BIOL 44201 - Introductory Module: Protein Expression
- Biology Lab Selective (Req 11) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req 11) - Credit Hours: 1.00 - 2.00
- STAT 50300 - Statistical Methods For Biology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00



- Elective - Credit Hours: 3.00

## 14-18 Credits

### Spring 4th Year

- BIOL Selective (Req # 13) - Credit Hours: 3.00
- 500 Level Biology Selective (Req # 12) - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

## 13 Credits

### Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## **Ecology, Evolution, and Environmental Biology, BS**

# About the Program

This major investigates how organisms interact with their physical environment and other organisms, from an evolutionary perspective. Ecologists' work includes research and/or teaching involving population genetics and evolution, adaptive strategies for survival, the nature of populations, and community ecology. Ecologists also offer technical services in connection with environmental impact decisions and regional planning, and environmental education at various levels as teacher, naturalist, or journalist. Common career paths for undergraduate students include graduate study leading to academic positions (research and teaching in small colleges and major universities), technical positions in industry (mostly dealing with environmental assessment), and employment in state and federal environmental agencies.

Ecology, Evolution, and Environmental Sciences Website

## Summary of Program Requirements

The Summary of Program Requirements for Ecology, Evolution and Environmental Sciences is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-EEEE  
120 Credits

## Departmental/Program Major Courses (34-41 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (26-29 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 58000 - Evolution
- BIOL 58500 - Ecology

- BIOL 49400 - Biology Research (w/approval) or
- BIOL 49900 - Biology Honors Thesis Research (w/approval) or
- BIOL 59100 - Field Ecology

### \*Intermediate Biology Selective (3-4 credits)

Select one; cannot also be used for Major Selectives below

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00 - 4.00

### \*Major Selectives (5-8 credits)

Select one unique course for each: one course may satisfy only one selective

- Biology Selective (Req # 13) - Credit Hours: 3.00 - 4.00
- Biology Selective (Req # 14) - Credit Hours: 2.00 - 4.00

### Other Departmental /Program Course Requirements (64-79 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- Chem Selective - Credit Hours: 3.00 - 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00

- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (0-22 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00

- BIOL 11500 - Biology Resource Seminar

## 16-18 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 3rd Year

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00
- STAT 50300 - Statistical Methods For Biology
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

## 13-16 Credits

### Spring 3rd Year

- BIOL 58500 - Ecology
- Chem Selective - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

## 13-14 Credits

### Fall 4th Year

- BIOL 58000 - Evolution
- Biology Selective (Req # 14) - Credit Hours: 3.00 - 4.00
- BIOL 49400 - Biology Research or
- BIOL 49900 - Biology Honors Thesis Research or
- BIOL 59100 - Field Ecology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Elective - Credit Hours: 3.00

## 13-16 Credits

### Spring 4th Year

- Biology 500 Level Selective (Req # 13) - Credit Hours: 3.00 - 4.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

## 12-14 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Genetics, BS

## About the Program

Genetics is the science of information transfer from one generation to another. We learn the laws of inheritance in all creatures big and small, how they evolve and how they change. On the molecular level we learn about DNA and RNA, on the cellular level we discover what makes a cell cancerous, and on an organismal level we examine the reproductive habits of various organisms. Crucial principles include the structure, function, and transmission of genes. Laboratory techniques explore genetic engineering from the "inside." Genetics is crucial to all of biology, hence a genetics major has great flexibility. This is excellent preparation for advanced study in biological sciences, law, genetic counseling, and many health-related professions.

Genetic Biology Website

### Summary of Program Requirements

The Summary of Program Requirements for Genetic Biology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-GNTC  
120 Credits

## Departmental/Program Major Courses (34 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (25 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 44100 - Biology Senior Seminar In Genetics
- BIOL 48100 - Eukaryotic Genetics
- BIOL 44201 - Introductory Module: Protein Expression

### \*Intermediate Biology Selective (3-4 credits)

Select one; cannot also be used for Major Selectives below

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00 - 4.00

### \*Major Selectives - Select one course for each requirement (11-13 credits)

- 500 Level Biology Selective (Req # 13) - Credit Hours: 3.00
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00
- Biology Selective (Req # 13) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (64-79 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)



- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Chem Selective (4 credits)

- BCHM 56100 - General Biochemistry I or
- CHM 53300 - Introductory Biochemistry or
- CHM 33900 (plus 33901 if CHM 12901 is taken for gen chemistry)

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or

- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (5-23 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 3rd Year

- Biology Selective (Req # 13) - Credit Hours: 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

## 16 Credits

### Spring 3rd Year

- BIOL 48100 - Eukaryotic Genetics
- PHYS 2 Selective - Credit Hours: 4.00
- Chem Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology

- General Education 3 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- Intermediate Biology Selective (Req #9) - Credit Hours: 3.00 - 4.00
- BIOL 44100 - Biology Senior Seminar In Genetics
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- STAT 50300 - Statistical Methods For Biology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Elective - Credit Hours: 3.00

## 14-18 Credits

### Spring 4th Year

- 500 Level Biology Selective (Req # 13) - Credit Hours: 3.00
- BIOL 44201 - Introductory Module: Protein Expression (Req # 12)
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

## 14-16 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Health and Disease, BS

# About the Program

Health and disease is a biology program of study with an emphasis on disease-related upper-level biology courses and general education electives that relate to health. The major provides a rigorous curriculum for students interested in health careers, thus giving the student many career options after graduation.

Health and Disease Website

### Summary of Program Requirements

The Summary of Program Requirements for Health and Disease is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-HLDS  
120 Credits

## Departmental/Program Major Courses (39 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (30 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms

- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 30100 - Human Design: Anatomy And Physiology
- BIOL 30200 - Human Design: Anatomy And Physiology
- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology

**\*Major Selectives - Select course for each requirement (must total at least 9 credits)**

- Health & Disease Selective (Req # 13) - Credit Hours: 3.00
- Biology Selective (Req # 14) - Credit Hours: 2.00 - 3.00
- 500 Level Biology Selective (Req # 14) - Credit Hours: 2.00 - 3.00
- Biology Selective (Req # 14) - Credit Hours: 0.00 - 2.00

**Other Departmental /Program Course Requirements (67-79 credits)**

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
  
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- Chem selective - Credit Hours: 3.00 - 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)

- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Pre-professional Selective - Credit Hours: 3.00

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (2-14 credits)

### 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

### Program Requirements

(Beginning with CHM 11500 in Fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

## 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00



15 Credits

### Fall 3rd Year

- BIOL 30100 - Human Design: Anatomy And Physiology
- Biology Selective (Req # 14) - Credit Hours: 2.00 - 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

### Spring 3rd Year

- BIOL 30200 - Human Design: Anatomy And Physiology
- PHYS 2 Selective - Credit Hours: 4.00
- Chem Selective - Credit Hours: 3.00 - 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

18 Credits

### Fall 4th Year

- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology
- STAT 50300 - Statistical Methods For Biology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Elective - Credit Hours: 4.00

13-15 Credits

### Spring 4th Year

- 500 Level Biology Selective (Req # 14) - Credit Hours: 2.00 - 3.00
- Health & Disease Selective (Req # 13) - Credit Hours: 3.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00

- Great Issues Selective - Credit Hours: 3.00
- Pre-professional selective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

## 15-17 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Microbiology Honors, BS

## About the Program

Microbiology includes the study of viruses, bacteria, and fungi. A student can expect to study topics such as microbial growth, nutrition, metabolism, pathogenesis, morphogenesis, and production of antibiotics. Career opportunities are found in public health, medical laboratories, quality assurance, environmental toxicology, and related areas. A microbiology major provides excellent preparation for advanced study (or direct employment) in biological sciences, education, and many health-related professions.

Microbiology Website

## Summary of Program Requirements

The Summary of Program Requirements for Microbiology Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-MICH  
120 Credits

## Departmental/Program Major Courses (43-47 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (37 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 41600 - Viruses And Viral Disease
- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology
- BIOL 52900 - Bacterial Physiology
- BIOL 54100 - Molecular Genetics Of Bacteria
- MA 26100 - Multivariate Calculus

### \*Major Selectives - Select one course for each requirement (10-14 credits)

- Biology Selective - Credit Hours: 3.00
- Chemistry Selective - Credit Hours: 3.00
- Microbiology Honors Selective - Credit Hours: 0.00 - 4.00
- Microbiology Honors Selective - Credit Hours: 4.00

## Other Departmental /Program Course Requirements (66-76 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- CHM 3xxxx Biochemistry Life Science - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Calculus 1 Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (4-5 credits)

- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (0-7 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

[link to plan of study](#)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 4.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 16-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

### 17-19 Credits

## Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- MA 26100 - Multivariate Calculus
- Language/Culture 3 Selective - Credit Hours: 3.00

16 Credits

## Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

15 Credits

## Fall 3rd Year

- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

15 Credits

## Spring 3rd Year

- BIOL 41600 - Viruses And Viral Disease
- CHM 3xxxx - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

## 14-15 Credits

### Fall 4th Year

- BIOL 54100 - Molecular Genetics Of Bacteria
- STAT 50300 - Statistical Methods For Biology
- Microbiology Honors Selective - Credit Hours: 4.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## 14-17 Credits

### Spring 4th Year

- Biology Selective - Credit Hours: 3.00
- BIOL 52900 - Bacterial Physiology
- Microbiology Honors Selective - Credit Hours: 4.00
- Great Issues Selective - Credit Hours: 3.00

## 13 Credits

### Note

120 semester credits required for Bachelor of Science degree.

3.0 Graduation GPA required for Microbiology Honors major.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Microbiology, BS

### About the Program

Microbiology includes the study of viruses, bacteria, and fungi. A student can expect to study topics such as microbial growth, nutrition, metabolism, pathogenesis, morphogenesis, and production of antibiotics. Career opportunities are found in public health, medical laboratories, quality assurance, environmental toxicology, and related areas. A microbiology major provides excellent preparation for advanced study (or direct employment) in biological sciences, education, and many health-related professions.

Microbiology Website

#### Summary of Program Requirements

The Summary of Program Requirements for Microbiology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-MICR  
120 Credits

### Departmental/Program Major Courses (51-53 credits)

\*A 2.0 average is required in these courses

#### \*Required Major Courses (33 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology



- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 41600 - Viruses And Viral Disease
- BIOL 43800 - General Microbiology
- BIOL 43900 - Laboratory In General Microbiology
- BIOL 52900 - Bacterial Physiology
- BIOL 54100 - Molecular Genetics Of Bacteria

### \*Major Selectives - Select one course for each requirement (6 credits)

- Biology Selective - Credit Hours: 3.00 (Req # 14)

### Other Departmental /Program Course Requirements (64-76 credits)

- CHM 11500 - General Chemistry (if CHM 12901 is not taken) (satisfies Science Selective for core)
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core); (satisfies Information Literacy Selective for core)
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

### Chem Selective (4 credits)

- BCHM 56100 - General Biochemistry I or
- CHM 33900 (plus 33901 if CHM 12901 is taken for gen chemistry)

## Calculus 1 Selective - Select from (3-5 credits)

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from (3-5 credits)

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (5-17 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

## 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

## 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

## 15 Credits

### Fall 3rd Year

- BIOL 43800 - General Microbiology

- BIOL 43900 - Laboratory In General Microbiology
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

### Spring 3rd Year

- BIOL 41600 - Viruses And Viral Disease
- Chem Selective - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

14-15 Credits

### Fall 4th Year

- BIOL 54100 - Molecular Genetics Of Bacteria
- STAT 50300 - Statistical Methods For Biology
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 4.00

14-16 Credits

### Spring 4th Year

- Biology Selective (Req # 14) - Credit Hours: 3.00
- BIOL 52900 - Bacterial Physiology
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

16 Credits

Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

# Neurobiology and Physiology, BS

## About the Program

Physiology is the study of the functions of living organisms and of the organ and tissue systems of which they are composed. The goal of physiology is to understand, in terms of physical and chemical principles, the mechanisms that operate in living organisms from the subcellular level to the level of the whole animal, with an emphasis on how these mechanisms are integrated to produce a viable organism.

Neurobiology is the study of the structure, function, and development of the nervous system, and originated, in part, as a subdiscipline of physiology. In recent years, neurobiology has become one of the most rapidly changing and exciting areas of biology. A neurobiology and physiology major is excellent preparation for careers in education, research, industry, medicine, veterinary medicine, and other professions.

Neurobiology and Physiology Website

### Summary of Program Requirements

The Summary of Program Requirements for Neurobiology and Physiology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

BIOLOGY-BS  
Code-NRPH  
120 Credits

## Departmental/Program Major Courses (38-41 credits)

\*A 2.0 average is required in these courses

### \*Required Major Courses (23 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior (satisfies Science, Technology & Society Selective for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  
- BIOL 13500 - First year Biology Laboratory or
- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project or
- IT 22600 - Biotechnology Laboratory I
  
- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 32800 - Principles Of Physiology

### \*Major Selectives - Select one course for each requirement (15-18 credits)

- Neurobiology & Physiology Selective (Req # 10) - Credit Hours: 3.00
- 500 Level Neurobiology & Physiology Selective (Req # 10) - Credit Hours: 3.00
- Biology Selective (Req # 13) - Credit Hours: 3.00
- Neurobiology & Physiology Lab Selective (Req # 11) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req # 12) - Credit Hours: 1.00 - 2.00

## Other Departmental /Program Course Requirements (64-76 credits)

- CHM 11500 - General Chemistry (if 12901 is not taken) (satisfies Science Selective for core)
  
- CHM 11600 - General Chemistry or
- CHM 12901 - General Chemistry With A Biological Focus
  
- Organic CHM 1 Selective - Credit Hours: 4.00
- Organic CHM 2 Selective - Credit Hours: 4.00

- Chem Selective - Credit Hours: 3.00 - 4.00
- PHYS 1 Selective (satisfies Science Selective for core) - Credit Hours: 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- STAT 50300 - Statistical Methods For Biology
- Computer Science Selective - Credit Hours: 3.00 - 4.00
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core)
  
- Language & Culture 1 Selective - Credit Hours: 3.00
- Language & Culture 2 Selective - Credit Hours: 3.00
- Language & Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- General Education 1 Selective (satisfies Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education 2 Selective (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education 3 Selective - Credit Hours: 3.00
- Teambuilding & Collaboration Selective - Credit Hours: 0.00 - 3.00
- Great Issues Selective - Credit Hours: 3.00
- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00

## Calculus 1 Selective - Select from

(satisfies Quantitative Reasoning Selective for core)

- MA 23100 or
- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I

## Calculus 2 Selective - Select from

- MA 23200 or
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II or
- MA 17300 - Calculus And Analytic Geometry II

## Electives (0-15 credits)

## 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

## Program Requirements

(Beginning with CHM 11500 in Fall)

### Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13500 - First year Biology Laboratory
- CHM 11500 - General Chemistry
- Calculus I Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 1 Selective - Credit Hours: 3.00
- BIOL 11500 - Biology Resource Seminar

### 15-17 Credits

### Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- CHM 11600 - General Chemistry
- Calculus II Selective - Credit Hours: 3.00 - 5.00
- Language/Culture 2 Selective - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition

### 16-19 Credits

### Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- Organic Chem 1 Selective - Credit Hours: 4.00
- Language/Culture 3 Selective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation



15 Credits

### Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- Organic Chem 2 Selective - Credit Hours: 4.00
- BIOL 28600 - Introduction To Ecology And Evolution
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology
- General Education 1 Selective - Credit Hours: 3.00

15 Credits

### Fall 3rd Year

- Neurobiology & Physiology Selective (Req # 10) - Credit Hours: 3.00
- PHYS 1 Selective - Credit Hours: 4.00
- General Education 2 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

14 Credits

### Spring 3rd Year

- BIOL 32800 - Principles Of Physiology
- Chem Selective - Credit Hours: 3.00 - 4.00
- PHYS 2 Selective - Credit Hours: 4.00
- BIOL 39300 - Preparing For Your Future In Biology
- General Education 3 Selective - Credit Hours: 3.00

16 Credits

### Fall 4th Year

- Biology Selective (Req # 13) - Credit Hours: 3.00
- Neurobiology & Physiology Lab Selective (Req # 11) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req 12) - Credit Hours: 1.00 - 2.00
- Biology Lab Selective (Req 12) - Credit Hours: 1.00 - 2.00

- Multidisciplinary Selective - Credit Hours: 1.00 - 3.00
- Computer Science Selective - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 4.00

## 14-20 Credits

## Spring 4th Year

- 500 Level Neurobiology & Physiology Selective (Req # 10) - Credit Hours: 3.00
- STAT 50300 - Statistical Methods For Biology
- Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

## 16 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Minor

### Biological Sciences Minor

The following courses describe the minimum coursework necessary to earn a minor in Biology.

A 2.0 or higher average is required in courses used to complete the minor.

#### Part I - Complete the following courses (7-8 credits)

For acceptable regional campus options see below.

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- BIOL 13500 - First year Biology Laboratory <sup>2</sup>  
or
- BIOL 11000 - Fundamentals Of Biology I (AP credit for BIOL 11000-11100 is acceptable)
- BIOL 11100 - Fundamentals Of Biology II

#### Part II - Complete the following courses (6 credits)

- BIOL 23100 - Biology III: Cell Structure And Function or
- BIOL 23000 - Biology Of The Living Cell
  
- BIOL 24100 - Biology IV: Genetics And Molecular Biology or
- AGRY 32000 - Genetics

#### Part III - Complete one of the following courses (2-4 credits)

- BIOL 28600 - Introduction To Ecology And Evolution (spring)
- BIOL 30100 - Human Design: Anatomy And Physiology <sup>3</sup> (fall)
- BIOL 30200 - Human Design: Anatomy And Physiology <sup>3</sup> (spring)
- BIOL 32800 - Principles Of Physiology <sup>4</sup> (spring)
- BIOL 36700 - Principles Of Development (spring)
- BIOL 39500 - Special Assignments <sup>4</sup> (fall)
- BIOL 41500 - Introduction To Molecular Biology (fall)
- BIOL 41600 - Viruses And Viral Disease (spring)
- BIOL 42000 - Eukaryotic Cell Biology (fall)
- BIOL 43200 - Reproductive Physiology (alternate fall)
- BIOL 43600 - Neurobiology (fall)
- BIOL 43800 - General Microbiology (fall)
- BIOL 43900 - Laboratory In General Microbiology (fall)
- BIOL 44400 - Human Genetics (fall)
- BIOL 44600 - Molecular Bacterial Pathogenesis (spring)

- BIOL 47800 - Introduction to Bioinformatics (fall)
- BIOL 48100 - Eukaryotic Genetics (spring)
- BIOL 48300 - Great Issues: Environmental And Conservation Biology (spring)
- BIOL 51100 - Introduction To X-Ray Crystallography (spring)
- BIOL 51600 - Molecular Biology Of Cancer (spring)
- BIOL 51700 - Molecular Biology: Proteins (spring)
- BIOL 53700 - Immunobiology (spring)
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology (spring)
- BIOL 55900 - Endocrinology (fall)
- BIOL 56200 - Neural Systems (spring)
- BIOL 58000 - Evolution (fall)
- BIOL 58705 - Animal Communication (alternate fall)
- BIOL 59200 - The Evolution Of Behavior (alternate spring)
- BIOL 59500 - Special Assignments - Ecological Statistics (spring)
- BIOL 59500 - Special Assignments - Methods & Measurement in Physical Biochemistry (fall)
- BIOL 59500 - Special Assignments - Protein Bioinformatics (spring)
- BIOL 59500 - Special Assignments - Sensory Ecology (alternate spring)
- BIOL 59900 - Quantitative Physiology (spring)

## Part IV - Complete at least one of the following laboratory courses

- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function (fall)
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology (spring)
- BIOL 30100 - Human Design: Anatomy And Physiology <sup>3</sup> (fall)
- BIOL 30200 - Human Design: Anatomy And Physiology <sup>3</sup> (spring)
- BIOL 32800 - Principles Of Physiology <sup>4</sup> (spring)
- BIOL 36701 - Principles Of Development Lab (spring)
- BIOL 39500 - Special Assignments <sup>4</sup> (fall)
- AGRY 32100 - Genetics Laboratory (both)

## Note

<sup>2</sup> For alternative choices to BIOL 13500, see below.

<sup>3</sup> If both BIOL 30100 and 30200 are completed, they will meet the requirements for Parts III and IV of the minor. BIOL 30100 or 30200 alone will not meet any requirement for the minor.

<sup>4</sup> Either BIOL 32800 (Principles of Physiology) or BIOL 39500 (Macromolecules) alone will meet the requirements for Parts III and IV of the minor.

## These courses are also acceptable alternatives to BIOL 13500

- BIOL 14501 - First Year Biology Laboratory With Neuro Research Project (fall)
- BIOL 14502 - First Year Biology Laboratory With Micro Research Project (spring)
- IT 22600 - Biotechnology Laboratory I (fall)

These sequences are also acceptable for Part I of the Biology Minor

## IUPUI

- BIOL K1010 Concepts of Biology I
- BIOL K1030 Concepts of Biology II

## Calumet

- BIOL 10100 Introductory Biology
- BIOL 10200 Introductory Biology

## North Central (PNC)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
- BIOL 11600 Laboratory in Biology I: Diversity, Ecology and Behavior
- BIOL 11800 Laboratory in Biology II: Structure, Function and Development

## Ft. Wayne (IPFW)

- BIOL 11700 Principles of Ecology and Evolution
- BIOL 11900 Principles of Structure and Function

## Ft. Wayne (IPFW)

- BIOL 10800 Biology of Plants
- BIOL 10900 Biology of Animals

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

# Department of Chemistry

## Overview

The Department of Chemistry is located centrally on the Purdue campus and is housed in the *Richard B. Wetherill Laboratories(WTHR)* and the *Herbert C. Brown Laboratory of Chemistry(BRWN)*. Students, faculty, and staff have access to world class facilities both for teaching and research.

Our Mission | Our Vision

The Department is home to:

- 52 faculty members
- 350 undergraduate students
- 310 graduate students
- 90 support personnel

In the 2013 Academic Ranking of World Universities (Shanghai Rankings), our departments ranked 20th world-wide and 13th nationally.

## Faculty

<https://www.chem.purdue.edu/people/directory/faculty/>

## Contact Information

*Head:* Professor Timothy Zwier

*Graduate Admissions:* Dr. Robert E. Wild, Assistant Head

*Undergraduate Information:* Dr. Beatriz Cisneros

*Webmaster:* [webmaster@chem.purdue.edu](mailto:webmaster@chem.purdue.edu)

### **Mailing address:**

Department of Chemistry

560 Oval Drive

West Lafayette, Indiana 47907-2084

**Telephone** (765) 494-5200 **FAX** (765) 494-0239

## Graduate Information

For Graduate Information please see Chemistry Graduate Program Information.

## Baccalaureate

## Biochemistry, BSCH

## About the Program

Biochemists study the chemical basis of life. Some of the major problems include the transfer of genetic information to biological structures, the conversion of nutrients into cell constituents and their utilization as sources of energy, the storage of memory, and

the chemical nature of neural processes. Furthermore, biochemists are interested in the chemical details of important processes such as photosynthesis, blood clotting, fertilization, and other functions that may be unique to certain organisms. This program includes six credits of undergraduate research in a wide range of fields, including drug discovery, nano-medicine, protein structure determination, development and application of novel chemical tools to dissect different biological processes. By concentrating advanced elective credit hours in biochemistry and by taking biology courses, this degree provides an excellent preparation for medical, dental, or veterinary schools. This program would particularly benefit those planning careers in medical research.

Biochemistry (Chemistry) Website

### Summary of Program Requirements

The Summary of Program Requirements for Biochemistry (Chemistry) is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

CHEM-BSCHM

BICH

124 Credits

2.0 GPA in CHM courses and 2.0 GPA overall

## Departmental/Program Major Courses (107-120 credits)

### Required Major Courses (82 credits)

- CHM 12500 - Introduction To Chemistry I (satisfies Science Selective for core)
- CHM 12600 - Introduction To Chemistry II
- CHM 26505 - Organic Chemistry
- CHM 26500 - Organic Chemistry Laboratory
- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory
- CHM 32100 - Analytical Chemistry I
- CHM 24100 - Introductory Inorganic Chemistry
- CHM 34200 - Inorganic Chemistry
- CHM 37300 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CHM 37401 Physical Chemistry Lab - Credit Hours: 2.00
- CHM 37400 - Physical Chemistry
  
- BIOL 23100 - Biology III: Cell Structure And Function or
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
  
- BIOL 24100 - Biology IV: Genetics And Molecular Biology or
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology

- CHM 53300 - Introductory Biochemistry
- CHM 53800 - Molecular Biotechnology
- CHM 49900 - Special Assignments
- CHM 19400 - Freshman Chemistry Orientation
- CHM 29400 - Sophomore Chemistry Seminar
- CHM 49400 - Junior-Senior Chemistry Seminar
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)

## Other Departmental /Program Course Requirements (25-38 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language1 Selective LINK - Credit Hours: 0.00 - 3.00
- Language2 Selective LINK - Credit Hours: 0.00 - 3.00
- Language\_Culture3 Selective (select courses could satisfy Human Cultures Humanities for core.) LINK - Credit Hours: 0.00 - 3.00
- GeneralEd1 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd2 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd3 Selective (select courses could satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues Selective LINK - Credit Hours: 3.00
- Multidisciplinary Selective (can be satisfied with a minor) - Credit Hours: 3.00
  
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core) or
- STAT 35000 - Introduction To Statistics (satisfies Information Literacy Selective for core)
  
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## Electives (0-8 credits)

## 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

## Program Requirements

### Fall 1st Year

- CHM 12500 - Introduction To Chemistry I \*
- MA 16100 - Plane Analytic Geometry And Calculus I
- ENGL 10600 - First-Year Composition \*
- CHM 19400 - Freshman Chemistry Orientation
- Language I - Credit Hours: 3.00 \*\*

### 18 Credits

### Spring 1st Year

- CHM 12600 - Introduction To Chemistry II
- MA 16200 - Plane Analytic Geometry And Calculus II
- Language II - Credit Hours: 3.00 \*\*
- STS Elective\*/Multidisciplinary - Credit Hours: 3.00

### 16 Credits

### Fall 2nd Year

- CHM 26505 - Organic Chemistry
- CHM 26500 - Organic Chemistry Laboratory
- MA 26100 - Multivariate Calculus
- PHYS 17200 - Modern Mechanics
- CHM 29400 - Sophomore Chemistry Seminar

### 14 Credits

### Spring 2nd Year

- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory

- PHYS 27200 - Electric And Magnetic Interactions
- General Education - Credit Hours: 3.00 \*\*
- Language and Culture - Credit Hours: 3.00 \*\*

## 15 Credits

### Fall 3rd Year

- BIOL 23100 - Biology III: Cell Structure And Function or
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function
- CHM 53300 - Introductory Biochemistry
- CHM 49900 - Special Assignments
- CS 17700 - Programming With Multimedia Objects \*\* or
- CS 15800 - C Programming \*\*
- General Education - Credit Hours: 3.00

## 16-17 Credits

### Spring 3rd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology or
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology
- CHM 53800 - Molecular Biotechnology
- CHM 49900 - Special Assignments
- CHM 24100 - Introductory Inorganic Chemistry \*\*

## 14 Credits

### Fall 4th Year

- CHM 37300 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CHM 32100 - Analytical Chemistry I
- General Education - Credit Hours: 3.00 \*\*
- STAT 30100 - Elementary Statistical Methods \*\*
- CHM 49900 - Special Assignments

## 16 Credits

### Spring 4th Year

- CHM 37400 - Physical Chemistry
- CHM 37401 - Credit Hours: 1.00
- CHM 34200 - Inorganic Chemistry
- CHM 49400 - Junior-Senior Chemistry Seminar
- Great Issues - Credit Hours: 3.00 \*\*

## 13 Credits

### Note

\*Satisfies a University Core Requirement

\*\*Satisfies a Non-departmental Major Course Requirement

Students must earn a "C-" or better in all required university core courses.

Students must earn a cumulative GPA of 2.0 in all CHM courses.

Students must have 32 credits at the 30000 level or above taken at Purdue.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Chemistry (ACS), BSCH

### About the Program

Chemistry at Purdue University has a ratio of 1 faculty member for every 8 undergraduates, which allows students to enjoy a great deal of individualized attention. It also offers opportunities for mentoring programs and cutting-edge undergraduate research in a wide range of fields from drug discovery to climate change. Chemistry majors can pursue one of two degrees: B.S. in chemistry, accredited by the American Chemical Society (ACS); or the more flexible B.S. with chemistry as a field of study.

Chemistry (ACS accredited) is designed primarily for students planning professional careers as chemists in industry, universities, or research institutes. This degree program fulfills the recommendations of the Committee of Professional Training of the ACS and graduates will be certified by the ACS as having fulfilled its recommended requirements.

This degree provides an excellent preparation for students pursuing graduate school in Chemistry.

There is also the opportunity to complete in five years a dual degree with chemical engineering if the student has been accepted into the College of Engineering.

Chemistry - American Chemical Society Website

#### Summary of Program Requirements

The Summary of Program Requirements for Chemistry - American Chemical Society is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

CHEM-BSCHM

CHMA

120 Credits

2.0 GPA in CHM courses and 2.0 GPA overall

### Departmental/Program Major Courses (112-122 credits)

#### Required Major Courses (87 credits)

- CHM 12500 - Introduction To Chemistry I (satisfies Science Selective for core)
- CHM 12600 - Introduction To Chemistry II

- CHM 26505 - Organic Chemistry
- CHM 26500 - Organic Chemistry Laboratory
- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory
- CHM 32100 - Analytical Chemistry I
- CHM 24100 - Introductory Inorganic Chemistry
- CHM 34200 - Inorganic Chemistry
- CHM 34201 - Inorganic Chemistry Laboratory
- CHM 37300 - Physical Chemistry
- CHM 37400 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CHM 37401 Physical Chemistry Lab - Credit Hours: 1.00
- CHM 42400 - Analytical Chemistry II
- CHM 51300 - Chemical Literature
- CHM 53300 - Introductory Biochemistry
- CHM 19400 - Freshman Chemistry Orientation
- CHM 29400 - Sophomore Chemistry Seminar
- CHM 49400 - Junior-Senior Chemistry Seminar
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- MA 26200 - Linear Algebra And Differential Equations
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)

## Other Departmental /Program Course Requirements (29-38 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language1 Selective LINK - Credit Hours: 0.00 - 3.00
- Language2 Selective LINK - Credit Hours: 0.00 - 3.00
- Language\_Culture3 Selective (select courses could satisfy Human Cultures Humanities for core.) LINK - Credit Hours: 0.00 - 3.00
- GeneralEd1 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd2 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd3 Selective (select courses could satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues Selective LINK - Credit Hours: 3.00
- Multidisciplinary Selective (can be satisfied with a minor) - Credit Hours: 3.00
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core) or
- STAT 35000 - Introduction To Statistics (satisfies Information Literacy Selective for core)
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## Electives (0-8 credits)

## 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

## Program Requirements

### Fall 1st Year

- CHM 12500 - Introduction To Chemistry I \*
- MA 16100 - Plane Analytic Geometry And Calculus I
- ENGL 10600 - First-Year Composition \*
- CHM 19400 - Freshman Chemistry Orientation
- Language I - Credit Hours: 3.00 \*\*

### 18 Credits

### Spring 1st Year

- CHM 12600 - Introduction To Chemistry II
- MA 16200 - Plane Analytic Geometry And Calculus II
- Language II - Credit Hours: 3.00 \*\*
- PHYS 17200 - Modern Mechanics

### 17 Credits

### Fall 2nd Year

- CHM 26505 - Organic Chemistry

- CHM 26500 - Organic Chemistry Laboratory
- MA 26100 - Multivariate Calculus
- PHYS 27200 - Electric And Magnetic Interactions
- Language and Culture - Credit Hours: 3.00 \*\*
- CHM 29400 - Sophomore Chemistry Seminar

17 Credits

### Spring 2nd Year

- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory
- COM 21700 - Science Writing And Presentation
- MA 26200 - Linear Algebra And Differential Equations
- General Education - Credit Hours: 3.00 \*\*

16 Credits

### Fall 3rd Year

- CHM 32100 - Analytical Chemistry I
- STAT 30100 - Elementary Statistical Methods \*
- CHM 37300 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CS 17700 - Programming With Multimedia Objects \*\* or
- CS 15800 - C Programming \*\*

14-15 Credits

### Spring 3rd Year

- CHM 24100 - Introductory Inorganic Chemistry
- CHM 37400 - Physical Chemistry
- CHM 37401 - Credit Hours: 2.00
- General Education - Credit Hours: 3.00 \*\*
- CHM 51300 - Chemical Literature

13 Credits

## Fall 4th Year

- CHM 53300 - Introductory Biochemistry
- CHM 42400 - Analytical Chemistry II
- Multidisc.\*\*/STS Selective\* - Credit Hours: 3.00
- General Education - Credit Hours: 3.00 \*\*
- CHM Elective - Credit Hours: 3.00

15 Credits

## Spring 4th Year

- CHM 34200 - Inorganic Chemistry
- CHM 34201 - Inorganic Chemistry Laboratory
- CHM 49400 - Junior-Senior Chemistry Seminar
- Free elective - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00 \*\*

14 Credits

## Note

\*Satisfies a University Core Requirement

\*\*Satisfies a Non-departmental Major Course Requirement

Students must earn a "C-" or better in all required university core courses.

Students must earn a cumulative GPA of 2.0 in all CHM courses.

Students must have 32 credits at the 30000 level or above taken at Purdue.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Chemistry Education, BS

### About the Program

Chemistry education meets the requirements for certification to teach chemistry in the secondary schools of Indiana in addition to meeting the requirements for the B.S. degree with chemistry major. Students preparing to teach in junior/high/middle/secondary schools (grades 5-12) must meet the requirements set by the Teacher Education Council. These requirements are outlined in the Guide to Teacher Preparation and Licensure from the Office of Professional Preparation and Licensure at Purdue, [www.teach.purdue.edu](http://www.teach.purdue.edu).

Chemistry Education Website

#### Summary of Program Requirements

The Summary of Program Requirements for Chemistry Education is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

CHEM-BS-Teaching  
CHED

120 Credits

2.5 GPA in content courses and 2.0 GPA overall

### Departmental/Program Major Courses (116-123 credits)

### Required Major Courses (94 credits)

- CHM 12500 - Introduction To Chemistry I (satisfies Science Selective for core)
- CHM 12600 - Introduction To Chemistry II
- CHM 26505 - Organic Chemistry
  
- CHM 26500 - Organic Chemistry Laboratory or
- CHM 26300 - Organic Chemistry Laboratory
  
- CHM 26605 - Organic Chemistry
  
- CHM 26600 - Organic Chemistry Laboratory or
- CHM 26400 - Organic Chemistry Laboratory
  
- CHM 32100 - Analytical Chemistry I
- CHM 24100 - Introductory Inorganic Chemistry
- CHM 34200 - Inorganic Chemistry
- CHM 37300 - Physical Chemistry
- CHM 37400 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CHM 37401 Physical Chemistry Lab - Credit Hours: 1.00
- CHM 19400 - Freshman Chemistry Orientation
- CHM 29400 - Sophomore Chemistry Seminar
- EDCI 20500 - Exploring Teaching As A Career
- EDCI 28500 - Multiculturalism And Education (satisfies Human Cultures Humanities for core)
- EDCI 27000 - Introduction To Educational Technology And Computing (satisfies Information Literacy Selective for core)
- EDST 20000 - History And Philosophy Of Education (satisfies Human Cultures Humanities for core)
- EDPS 23500 - Learning And Motivation (satisfies Behavioral Social Sciences for core)
- EDPS 26500 - The Inclusive Classroom (satisfies Human Cultures Humanities for core)
- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 49800 - Supervised Teaching
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning for core)
- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)

## Other Departmental /Program Course Requirements (22-29 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language1 Selective LINK - Credit Hours: 0.00 - 3.00
- Language2 Selective LINK - Credit Hours: 0.00 - 3.00
- GeneralEd1 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd2 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- Great Issues Selective LINK - Credit Hours: 3.00

- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core) or
- STAT 35000 - Introduction To Statistics
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## 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

## Program Requirements

### Fall 1st Year

- CHM 12500 - Introduction To Chemistry I \*
- MA 16100 - Plane Analytic Geometry And Calculus I \*
- ENGL 10600 - First-Year Composition \*
- CHM 19400 - Freshman Chemistry Orientation
- EDCI 27000 - Introduction To Educational Technology And Computing \*\*

### 18 Credits

### Spring 1st Year

- CHM 12600 - Introduction To Chemistry II
- MA 16200 - Plane Analytic Geometry And Calculus II
- COM 21700 - Science Writing And Presentation \*\*
- PHYS 17200 - Modern Mechanics

### 16 Credits

## Fall 2nd Year

- CHM 26505 - Organic Chemistry
- CHM 26300 - Organic Chemistry Laboratory
- MA 26100 - Multivariate Calculus
- EDCI 20500 - Exploring Teaching As A Career
- EDCI 28500 - Multiculturalism And Education \*\*
- CHM 29400 - Sophomore Chemistry Seminar

15 Credits

## Spring 2nd Year

- CHM 26605 - Organic Chemistry
- CHM 26400 - Organic Chemistry Laboratory
- CHM 24100 - Introductory Inorganic Chemistry
- PHYS 27200 - Electric And Magnetic Interactions
- EDST 20000 - History And Philosophy Of Education \*
- General Education - Credit Hours: 3.00

17 Credits

## Fall 3rd Year

- CHM 37300 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- STAT 30100 - Elementary Statistical Methods \*
- EDPS 23500 - Learning And Motivation
- EDPS 26500 - The Inclusive Classroom
- Language 10100 - Credit Hours: 3.00

16 Credits

## Spring 3rd Year

- CHM 34200 - Inorganic Chemistry
- CHM 37400 - Physical Chemistry
- CHM 37401 - Credit Hours: 1.00
- General Education - Credit Hours: 3.00

- Language10200 - Credit Hours: 3.00
- Science Tech Society Selective - Credit Hours: 3.00 \*\*

## 16 Credits

### Fall 4th Year

- CHM 32100 - Analytical Chemistry I
- CHM 33300 - Principles Of Biochemistry
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools
- CS 17700 - Programming With Multimedia Objects or
- CS 15800 - C Programming
- Great Issues - Credit Hours: 3.00

## 17 Credits

### Spring 4th Year

- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 49800 - Supervised Teaching

## 15 Credits

## Note

\*Satisfies a University Core Requirement

\*\*Satisfies a Non-departmental Major Course Requirement

Students must earn a "C-" or better in all required university core courses.

Students must earn a CHM content GPA of 2.5.

Students must have 32 credits at the 30000 level or above taken at Purdue.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Chemistry, BS

### About the Program

Chemistry at Purdue University has a ratio of 1 faculty member for every 8 undergraduates, which allows students to enjoy a great deal of individualized attention. It also offers opportunities for mentoring programs and cutting-edge undergraduate research in a wide range of fields from drug discovery to climate change.

The B.S. program with chemistry as a field of study is designed for those who want training in chemistry and freedom to pursue minors or second majors in other areas. Common areas of interest have been Forensic Sciences, Biology, Foreign Languages, Management, Psychology, and other Liberal Arts areas. The flexibility in this program adapts easily to Study Abroad semesters.

Chemistry Website

#### Summary of Program Requirements

The Summary of Program Requirements for Chemistry is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

## Departmental/Program Major Courses (92-101 credits)

### Required Major Courses (63 credits)

- CHM 12500 - Introduction To Chemistry I (satisfies Science Selective for core)
- CHM 12600 - Introduction To Chemistry II
- CHM 26505 - Organic Chemistry
- CHM 26500 - Organic Chemistry Laboratory
- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory
- CHM 32100 - Analytical Chemistry I
- CHM 24100 - Introductory Inorganic Chemistry
- CHM 34200 - Inorganic Chemistry
- CHM 37300 - Physical Chemistry
- CHM 37400 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- CHM 37401 Physical Chemistry Lab - Credit Hours: 1.00
- CHM 19400 - Freshman Chemistry Orientation
- CHM 29400 - Sophomore Chemistry Seminar
- CHM 49400 - Junior-Senior Chemistry Seminar
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)

### Other Departmental /Program Course Requirements (29-38 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication for core) (satisfies Information Literacy Selective for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language1 Selective LINK - Credit Hours: 0.00 - 3.00
- Language2 Selective LINK - Credit Hours: 0.00 - 3.00
- Language\_Culture3 Selective (select courses could satisfy Human Cultures Humanities for core.) LINK - Credit Hours: 0.00 - 3.00
- GeneralEd1 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd2 Selective (select courses could satisfy Human Cultures Humanities for core) LINK - Credit Hours: 3.00
- GeneralEd3 Selective (select courses could satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues Selective LINK - Credit Hours: 3.00
- Multidisciplinary Selective (can be satisfied with a minor) - Credit Hours: 3.00

- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core) or
- STAT 35000 - Introduction To Statistics (satisfies Information Literacy Selective for core)
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## Electives (19-28 credits)

## 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

## Program Requirements

### Fall 1st Year

- CHM 12500 - Introduction To Chemistry I \*
- MA 16100 - Plane Analytic Geometry And Calculus I
- ENGL 10600 - First-Year Composition \*
- CHM 19400 - Freshman Chemistry Orientation
- Language I - Credit Hours: 3.00 \*\*

### 18 Credits

### Spring 1st Year

- CHM 12600 - Introduction To Chemistry II
- MA 16200 - Plane Analytic Geometry And Calculus II
- Language II - Credit Hours: 3.00 \*\*
- Science, Technology and Society - Credit Hours: 3.00

### 16 Credits



## Fall 2nd Year

- CHM 26505 - Organic Chemistry
- CHM 26500 - Organic Chemistry Laboratory
- MA 26100 - Multivariate Calculus
- PHYS 17200 - Modern Mechanics
- General Education - Credit Hours: 3.00

15 Credits

## Spring 2nd Year

- CHM 26605 - Organic Chemistry
- CHM 26600 - Organic Chemistry Laboratory
- COM 21700 - Science Writing And Presentation
- PHYS 27200 - Electric And Magnetic Interactions
- Free Elective - Credit Hours: 3.00

15 Credits

## Fall 3rd Year

- CHM 32100 - Analytical Chemistry I
- STAT 30100 - Elementary Statistical Methods \*
- General Education - Credit Hours: 3.00
- Free elective - Credit Hours: 3.00
- Free elective - Credit Hours: 2.00

15 Credits

## Spring 3rd Year

- CHM 24100 - Introductory Inorganic Chemistry
- CS 17700 - Programming With Multimedia Objects or
- CS 15800 - C Programming
- General Education - Credit Hours: 3.00 \*\*
- Great Issues - Credit Hours: 3.00

## 14 Credits

### Fall 4th Year

- CHM 37300 - Physical Chemistry
- CHM 37301 - Physical Chemistry Laboratory
- Multidisciplinary - Credit Hours: 3.00 \*\*
- Language and Culture - Credit Hours: 3.00
- Free elective - Credit Hours: 3.00

## 13 Credits

### Spring 4th Year

- CHM 37400 - Physical Chemistry
- CHM 37401 - Credit Hours: 1.00
- CHM 34200 - Inorganic Chemistry
- Free elective - Credit Hours: 3.00
- Free elective - Credit Hours: 3.00
- CHM 49400 - Junior-Senior Chemistry Seminar

## 14 Credits

### Note

\*Satisfies a University Core Requirement

\*\*Satisfies a Non-departmental Major Course Requirement

Students must earn a "C-" or better in all required university core courses.

Students must earn a cumulative GPA of 2.0 in all CHM courses.

Students must have 32 credits at the 30000 level or above taken at Purdue.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

### 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.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Minor

### Chemistry Minor

#### Pre-Requisite Courses for Chem Minor

To complete the required courses for the Chemistry minor, you will need to first complete the following pre-requisite courses [by completing the course or establishing credit]. These courses are not part of the Chemistry minor.

- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I or
- MA 16020 - Applied Calculus II
  
- CHM 11500 - General Chemistry and
- CHM 11600 - General Chemistry  
or
- CHM 12500 - Introduction To Chemistry I and
- CHM 12600 - Introduction To Chemistry II  
or
- CHM 12901 - General Chemistry With A Biological Focus

#### Requirements for the Minor

The Chemistry Minor provides a strong background in Chemistry for students majoring in some other discipline

To qualify for the minor, the following classes must be completed with a cumulative GPA of 2.0 or better.

ALL COURSES FOR THIS MINOR LISTED BELOW MUST BE TAKEN AT PURDUE UNIVERSITY WEST LAFAYETTE.

To obtain a minor in Chemistry you can choose 16 credits from the following courses.

The 16 credits can come from Area 1 and/or Area 2 and/or Area 3 and/or Area 4 and any of the courses listed in the last block.

AREA 1: Organic Chemistry only one first semester and one second semester organic course, as described below.

AREA 2 and AREA 3: the OR which means one course or the other, both will not count.

TOTAL CREDITS FOR MINOR: 16 credits

### Area 1 Organic Chemistry (0-10 credits)

- CHM 25500 - Organic Chemistry or
- CHM 26100 - Organic Chemistry or
- CHM 26505 - Organic Chemistry or
- MCMP 20400 - Organic Chemistry I
  
- CHM 25600 - Organic Chemistry or
- CHM 26200 - Organic Chemistry or
- CHM 26605 - Organic Chemistry or
- MCMP 20500 - Organic Chemistry II
  
- CHM 25501 - Organic Chemistry Laboratory or
- CHM 26300 - Organic Chemistry Laboratory or
- CHM 26500 - Organic Chemistry Laboratory or
- CHM 26700 - Organic Chemistry Laboratory Honors
  
- CHM 25601 - Organic Chemistry Laboratory or
- CHM 26400 - Organic Chemistry Laboratory or
- CHM 26600 - Organic Chemistry Laboratory or
- CHM 26800 - Organic Chemistry Laboratory Honors

### Area 2 Physical Chemistry (0-7 credits)

- CHM 37200 - Physical Chemistry or
- CHM 37300 - Physical Chemistry
  
- CHM 37000 - Topics In Physical Chemistry or
- CHM 37400 - Physical Chemistry

### Area 3 Biochemistry (0-3 credits)

- CHM 53300 - Introductory Biochemistry or
- BCHM 56100 - General Biochemistry I or

- CHM 33900

## Area 4 Others

Course Choices in addition to Area 1, Area 2 and Area 3 options:

- CHM 32100 - Analytical Chemistry I
- CHM 32300 - Analytical Chemistry I Honors
- CHM 42400 - Analytical Chemistry II
- CHM 24100 - Introductory Inorganic Chemistry
- CHM 34200 - Inorganic Chemistry
- CHM 34201 - Inorganic Chemistry Laboratory
- CHM 37301 - Physical Chemistry Laboratory
- CHM 37401
- CHM 57900 - Computational Chemistry
- CHM 33901
- CHM 46200 - Intermediate Organic Chemistry
- CHM 56000 - Organic Spectroscopic Analysis
- CHM 53800 - Molecular Biotechnology
- CHM 58100 - Atmospheric Chemistry
- CHM 51300 - Chemical Literature
- CHM 49900 - Special Assignments
- CHM 29000 - Selected Topics In Chemistry For Lower-Division Students Integrated Science
- CHM 49000 - Selected Topics In Chemistry For Upper-Division Students Great Issues

Total: 16.00 credits or above

\*Please note that CHM 20000, CHM 22400, CHM 25700 and CHM 33300 cannot be used to complete the minor.

## Expired Course

Any course without a link to its description is one that has been expired. However, this course could fulfill the degree requirement historically.

## Department of Computer Science

## Department of Computer Science

Purdue Computer Science is one of the country's top-ranked programs. Faculty members are shaping the future of information technology through cutting-edge research. Students can take courses that include such topics as graphics and animation, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The Purdue University Department of Computer Science has a comprehensive and exciting curriculum for its undergraduate students. There is a great deal of flexibility in this curriculum. CS students begin by taking six core courses that teach them the fundamentals of computer science.

This curriculum offers adventurous young women and men an excellent opportunity to be involved in a dynamic discipline that will continue to grow and to contribute significantly to progress in many other disciplines and ultimately to changes in human society that are nothing short of profound. Computer Science graduates pursue careers in animation and visualization, biotechnology, computational finance, computer graphics, consulting, information security, wireless systems, and software engineering. Many also go on to graduate or professional school in areas such as business, law, or medicine. Students learn communication skills, teamwork, and problem-solving skills and acquire the necessary technical skills for positions in computing in nearly any industry.

The Purdue Computer Science Department offers a Bachelor of Science (BS), a minor in computer science, or a 5-year combined BS/MS degree. The department also offers an Honors Program, and the opportunity to participate in the Cooperative Education Program.

Computer Science Website

## Faculty

<https://www.cs.purdue.edu/people/faculty/index.html>

## Contact Information

### General Department Contact

Purdue University  
Department of Computer Science  
305 N. University Street  
West Lafayette, IN 47907-2107  
Phone: (765) 494-6010  
Fax: (765) 494-0739

## Graduate Information

For Graduate Information please see Computer Science Graduate Program Information.

## Baccalaureate

## Computer Science Honors, BS

## About the Program

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The department is located in the Lawson Computer Science Building, which opened in 2006. In addition to offering an inviting and comfortable environment, the building is equipped with cutting-edge networking and computing technologies, including 10-gigabit Ethernet cabling and wireless access throughout the building. There are four classrooms, four instructional labs, five research labs, and a student activity center. The building also offers students a variety of interaction areas, and a deli-style café and espresso bar. A 16-by-9 foot tiled video wall donated by the Harris Corporation is used for a variety of purposes, including notices of campus events, workshop and colloquium speakers, news and information, research demonstrations, and class projects.

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- Computational Science and Engineering
- Computer Graphics and Visualization
- Database and Information Systems
- Foundations of Computer Science
- Machine Intelligence
- Programming Languages
- Security
- Software Engineering
- Systems Programming

This curriculum offers adventurous young women and men an excellent opportunity to be involved in a dynamic discipline that will continue to grow and to contribute significantly to progress in many other disciplines and ultimately to changes in human society that are nothing short of profound.

Computer Science Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Computer Science Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

Code - BS  
Code - CSHO  
120 cr for graduation  
"C" or better in all major courses

## **Computer Science Honors Major Courses (at least 59 credits)**

### **Required CS Honors Major Math Courses (7-8 credits)**

- MA 26100 - Multivariate Calculus or

- MA 17400 - Multivariable Calculus or
- MA 18200 - Honors Calculus II or
- MA 27100 - Several Variable Calculus
  
- MA 35100 - Elementary Linear Algebra

## Required CS Major Core Courses (21 credits)

- CS 18000 - Problem Solving And Object-Oriented Programming (satisfies CoS computing requirement)
- CS 18200 - Foundations Of Computer Science
- CS 24000 - Programming In C
- CS 25000 - Computer Architecture
- CS 25100 - Data Structures And Algorithms
- CS 25200 - Systems Programming

## Required CS Major Track Selectives - (18-21 credits)

select from list [LINK](#)

- CS Track Required course - Credit Hours: 3.00
- CS Track Required Course - Credit Hours: 3.00
- CS Track Required/Elective course - Credit Hours: 3.00
- CS Track Required/Elective course - Credit Hours: 3.00
- CS Track Elective course - Credit Hours: 3.00
- CS Track Elective course - Credit Hours: 3.00
- CS Track Elective course (if Computational Science & Engineering track or Database & Information Systems track) - Credit Hours: 3.00

## Required CS Honors - (13 credits)

select from list (need CS GPA of 3.60 or better & cumGPA of 3.25) [LINK](#)

- MA course > MA 35100 - Elementary Linear Algebra
- ECE 27000 - Introduction To Digital System Design
- CS 39700 - Honors Seminar
- CS 49700 - Honors Research Project (may use for Track Elective - see Track chairperson for approval)
- CS 500 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00

## Other Departmental/Program Course Requirements (44-62 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy)
  
- Technical Writing - (may satisfy Oral Communication) select from list [LINK](#) - Credit Hours: 0.00 - 3.00
- Technical Presentation - (may satisfy Oral Communication) select from list [LINK](#) - Credit Hours: 0.00 - 3.00



- Language I - select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- Language II - select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III - (may satisfy Human Cultures Humanities) select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- General Education I - (may satisfy Human Culture Humanities and Behavioral/Social Science) select from list LINK - Credit Hours: 3.00
- General Education II - (may satisfy Human Culture Humanities and Behavioral/Social Science) select from list LINK - Credit Hours: 3.00
- General Education III - select from list LINK - Credit Hours: 3.00
- Great Issues -select from list LINK - Credit Hours: 3.00
- Multidisciplinary - select from list LINK - Credit Hours: 0.00 - 3.00
- Teambuilding and Collaboration Experience - select from list LINK - Credit Hours: 0.00 - 4.00
- Lab Science I selective - (satisfies Science) select from list LINK - Credit Hours: 3.00 - 4.00
- Lab Science II selective - (may satisfy Science) select from list LINK - Credit Hours: 3.00 - 4.00
  
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning)
  
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning) or
- MA 17300 - Calculus And Analytic Geometry II (satisfies Quantitative Reasoning) or
- MA 18100 - Honors Calculus I (satisfies Quantitative Reasoning)
  
- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

## Electives (0-17 credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.cs.purdue.edu/academic\\_programs/undergraduate/curriculum/bachelor/index.sxhtml](http://www.cs.purdue.edu/academic_programs/undergraduate/curriculum/bachelor/index.sxhtml)

## Fall 1st Year

- CS 17700 - Programming With Multimedia Objects (free elective) \*\*\*
- CS 19100 - Freshman Resources Seminar (Free elective)
- Pre-Calculus I (no credit) - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- CS 19000 - Topics In Computer Sciences (Free elective)
- General Education I - Credit Hours: 2.00

## 14-15 Credits

### Spring 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming \*\*\*
- Calculus I - Credit Hours: 4.00 - 5.00
- Language 10100 - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- CS 19700 - Freshman Honors Seminar (Free elective)
- Free elective - Credit Hours: 1.00

## 16-17 Credits

### Fall 2nd Year

- CS 18200 - Foundations Of Computer Science \*\*\*
- CS 24000 - Programming In C \*\*\*
- Calculus II - Credit Hours: 4.00 - 5.00
- Language 10200 - Credit Hours: 3.00 - 4.00
- CS 29100 - Sophomore Development Seminar (Free elective)

## 14-16 Credits

### Spring 2nd Year

- CS 25000 - Computer Architecture \*\*\*
- CS 25100 - Data Structures And Algorithms \*\*\*
- Calc III - Credit Hours: 4.00 - 5.00
- Language 201 or Culture or Diversity course - Credit Hours: 3.00
- General Education II - Credit Hours: 3.00

## 17-18 Credits

### Fall 3rd Year

- CS 25200 - Systems Programming \*\*\*
- CS track requirement - Credit Hours: 3.00 \*\*\*
- MA 35100 - Elementary Linear Algebra
- CS 39700 - Honors Seminar (Free elective)
- General Education III - Credit Hours: 3.00
- Free elective - Credit Hours: 3.00

## 16 Credits

### Spring 3rd Year

- CS track requirement - Credit Hours: 3.00 \*\*\*
- CS track elective - Credit Hours: 3.00 \*\*\*
- Great Issues - Credit Hours: 3.00
- MA> MA 35100 - Elementary Linear Algebra
  
- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

## 15 Credits

### Fall 4th Year

- CS track elective - Credit Hours: 3.00 \*\*\*
- Lab Science I - Credit Hours: 3.00 - 4.00
- Multidisciplinary - Credit Hours: 3.00
- CS 49700 - Honors Research Project
- ECE 27000 - Introduction To Digital System Design

## 16-17 Credits

### Spring 4th Year

- CS track elective - Credit Hours: 3.00 \*\*\*

- CS track elective - Credit Hours: 3.00 \*\*\*
- Lab Science II - Credit Hours: 3.00 - 4.00
- CS 50000 level - Credit Hours: 3.00

## 12-13 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Major and Graduation GPA required for Bachelor of Science degree.

\*\*\*All CS core courses and all track requirements, regardless of department, must be completed with a grade of "C" or higher (effective fall 2011).

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

MyPurdue Plan is a 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.

## Computer Science, BS

## About the Program

Purdue Computer Science is one of the country's top-ranked programs. Faculty members are shaping the future of information technology through cutting-edge research. Students can take courses that include such topics as graphics and animation, robotics, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

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research labs, and a student activity center. The building also offers students a variety of interaction areas, and a deli-style café and espresso bar. A 16-by-9 foot tiled video wall donated by the Harris Corporation is used for a variety of purposes, including notices of campus events, workshop and colloquium speakers, news and information, research demonstrations, and class projects.

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- Computer Graphics and Visualization
- Database and Information Systems
- Foundations of Computer Science
- Machine Intelligence
- Programming Languages
- Security
- Software Engineering
- Systems Programming

This curriculum offers adventurous young women and men an excellent opportunity to be involved in a dynamic discipline that will continue to grow and to contribute significantly to progress in many other disciplines and ultimately to changes in human society that are nothing short of profound.

Computer Science Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Computer Science is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

Code - BS  
Code - CS  
120 cr for graduation  
"C" or better in all major courses

## **Computer Science Major Courses (at least 46 credits)**

### **Required CS Major Math Courses (7-8 credits)**

- MA 26100 - Multivariate Calculus or
- MA 17400 - Multivariable Calculus or
- MA 18200 - Honors Calculus II or
- MA 27100 - Several Variable Calculus
  
- MA 26500 - Linear Algebra or

- MA 35100 - Elementary Linear Algebra

## Required CS Major Core Courses (21 credits)

- CS 18000 - Problem Solving And Object-Oriented Programming (satisfies CoS computing requirement)
- CS 18200 - Foundations Of Computer Science
- CS 24000 - Programming In C
- CS 25000 - Computer Architecture
- CS 25100 - Data Structures And Algorithms
- CS 25200 - Systems Programming

## Required CS Major Track Selectives - (18-21 credits)

select from list LINK

- CS Track Required course - Credit Hours: 3.00
- CS Track Required Course - Credit Hours: 3.00
- CS Track Required/Elective course - Credit Hours: 3.00
- CS Track Required/Elective course - Credit Hours: 3.00
- CS Track Elective course - Credit Hours: 3.00
- CS Track Elective course - Credit Hours: 3.00
- CS Track Elective course (if Computational Science & Engineering track or Database & Information Systems track) - Credit Hours: 3.00

## Other Departmental/Program Course Requirements (44-62 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy)
- Technical Writing - (may satisfy Oral Communication) select from list LINK - Credit Hours: 0.00 - 3.00
- Technical Presentation - (may satisfy Oral Communication) select from list LINK - Credit Hours: 0.00 - 3.00
- Language I - select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- Language II - select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III - (may satisfy Human Cultures Humanities) select from three options; select from list LINK - Credit Hours: 3.00 - 4.00
- General Education I - (may satisfy Human Culture Humanities and Behavioral/Social Science) select from list LINK - Credit Hours: 3.00
- General Education II - (may satisfy Human Culture Humanities and Behavioral/Social Science) select from list LINK - Credit Hours: 3.00
- General Education III - select from list LINK - Credit Hours: 3.00
- Great Issues -select from list LINK - Credit Hours: 3.00
- Multidisciplinary - (may satisfy Science, Technology & Society) select from list LINK - Credit Hours: 0.00 - 3.00
- Teambuilding and Collaboration Experience - select from list LINK - Credit Hours: 0.00 - 4.00
- Lab Science I selective - (satisfies Science) select from list LINK - Credit Hours: 3.00 - 4.00
- Lab Science II selective - (may satisfy Science) select from list LINK - Credit Hours: 3.00 - 4.00

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning)
  
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning) or
- MA 17300 - Calculus And Analytic Geometry II (satisfies Quantitative Reasoning) or
- MA 18100 - Honors Calculus I (satisfies Quantitative Reasoning)
  
- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

## Electives (8-30 credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.cs.purdue.edu/academic\\_programs/undergraduate/curriculum/bachelor/index.sxhtml](http://www.cs.purdue.edu/academic_programs/undergraduate/curriculum/bachelor/index.sxhtml)

## Fall 1st Year

- CS 17700 - Programming With Multimedia Objects (free elective) \*\*\*
- CS 19100 - Freshman Resources Seminar (Free elective)
- Pre-Calculus I (no credit) - Credit Hours: 3.00
  
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
  
- CS 19000 - Topics In Computer Sciences Tools (Free elective)
- Free Elective - Credit Hours: 2.00

## 14-15 Credits

## Spring 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming \*\*\*
- Calculus I - Credit Hours: 4.00 - 5.00
- Language 10100 - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- Free elective/minor - Credit Hours: 2.00

## 16-17 Credits

## Fall 2nd Year

- CS 18200 - Foundations Of Computer Science \*\*\*
- CS 24000 - Programming In C \*\*\*
- Calculus II - Credit Hours: 4.00 - 5.00
- Language 10200 - Credit Hours: 3.00 - 4.00
- CS 29100 - Sophomore Development Seminar (Free elective)

## 14-16 Credits

## Spring 2nd Year

- CS 25000 - Computer Architecture \*\*\*
- CS 25100 - Data Structures And Algorithms \*\*\*
- Calc III - Credit Hours: 3.00
- Language 201 or Culture or Diversity course - Credit Hours: 3.00
- Free elective/minor - Credit Hours: 3.00

## 16 Credits

## Fall 3rd Year

- CS 25200 - Systems Programming \*\*\*
- CS track requirement - Credit Hours: 3.00 \*\*\*
- Linear Algebra - Credit Hours: 3.00
- CS 39100 - Junior Resources Seminar (Free elective)
- General Education I - Credit Hours: 3.00
- Free elective/minor - Credit Hours: 3.00



## 17 Credits

### Spring 3rd Year

- CS track requirement - Credit Hours: 3.00 \*\*\*
- CS track elective - Credit Hours: 3.00 \*\*\*
- Great Issues - Credit Hours: 3.00
- General Education II - Credit Hours: 3.00
  
- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

## 15 Credits

### Fall 4th Year

- CS track elective - Credit Hours: 3.00 \*\*\*
- Lab Science I - Credit Hours: 3.00 - 4.00
- Multidisciplinary - Credit Hours: 3.00
- General Education III - Credit Hours: 3.00
- Free elective/minor - Credit Hours: 3.00

## 15-16 Credits

### Spring 4th Year

- CS track elective - Credit Hours: 3.00 \*\*\*
- CS track elective - Credit Hours: 3.00 \*\*\*
- Lab Science II - Credit Hours: 3.00 - 4.00
- Free elective/minor - Credit Hours: 3.00
- Free elective/minor - Credit Hours: 1.00

## 13-14 Credits

## Note

120 semester credits required for Bachelor of Science degree.

2.0 Major and Graduation GPA required for Bachelor of Science degree.

\*\*\*All CS core courses and all track requirements, regardless of department, must be completed with a grade of "C" or higher (effective fall 2011).

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

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## 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.

## Minor

### Computer Science Minor

(Effective Summer 2013)

To obtain a minor concentration in Computer Sciences, CS courses must be completed with a grade of C or higher.

Five CS courses that fulfill CS major requirements.

All five courses must be taken at Purdue University - West Lafayette Campus

Only one CS 49000 (3 credits), can be used.

None of the following can be used:

- "CS\_9000" courses at other levels
- CS independent study courses
- EPCS courses (EPICS).
- CS courses numbered below 18000
- CS 23500

All pre- and co-requisites must be met.

The course prerequisite chart may be helpful in selecting the five courses

[http://www.cs.purdue.edu/academic\\_programs/undergraduate/curriculum/prereq.pdf](http://www.cs.purdue.edu/academic_programs/undergraduate/curriculum/prereq.pdf)

## Department of Earth, Atmospheric, and Planetary Sciences

## **Overview**

The Department of Earth, Atmospheric, and Planetary Sciences is dedicated to the scientific study of a myriad of spatial and temporal scales of physical, chemical, and dynamical processes that range from such seemingly diverse events as continental drift to asteroid impacts to tornadoes.

The new millennium has brought even greater challenges to unravel the mysteries of the past, present and future states of a holistic Earth system that affects our socio-economic well-being, as well as the delicate balance of weather, climate, and earth processes.

EAPS is the multidisciplinary department of the College of Science, requiring the use of mathematics, physics, chemistry, statistics, and computer sciences to research problems; along with state of the art computer and laboratory facilities for calculation, visualization, and experimentation. Our faculty, students and staff are dedicated to the department's mission and strategic plan and we hope that you enjoy your virtual tour of our world.

Indrajeet Chaubey  
Department Head and Professor

## **Faculty**

<http://www.eaps.purdue.edu/people/faculty.html>

## **Contact Information**

Earth, Atmospheric, and Planetary Sciences Department  
550 Stadium Mall Drive  
Purdue University  
West Lafayette, IN 47907-2051

Phone: 765 494-3258

Fax: 765 496-1210

## **Graduate Information**

For Graduate Information please see Earth, Atmospheric, and Planetary Sciences Graduate Program Information.

## **Baccalaureate**

## **Atmospheric Science, BS**

## **About the Program**

Within atmospheric science/meteorology, students can select elective courses to focus their study on weather forecasting, research, environmental monitoring, and specialties within those areas. The Earth, Atmospheric, and Planetary Sciences (EAPS) Department has a low faculty-to-student ratio, which allows students to have a lot of one-on-one interaction with their professors. All undergraduates are encouraged to take part in research.

Atmospheric Science/Meteorology Website

### Summary of Program Requirements

The Summary of Program Requirements for Atmospheric Science-Meteorology is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

code-BS  
Code-ATSC  
120 Credits  
"C-" or better required in ^ courses

## Departmental/Program Major Courses (31 credits)

### Required Major Courses (31 credits)

- EAPS 10900 - The Dynamic Earth ^ (fall) (also satisfies Science Selective for core)
- EAPS 11700 - Introduction To Atmospheric Science ^ (spring)
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring)
- EAPS 22500 - Science Of The Atmosphere ^ (fall) (also satisfies Science Selective for core)
- EAPS 32000 - Physics Of Climate (spring)
- EAPS 42100 - Atmospheric Thermodynamics (fall)
- EAPS 43100 - Synoptic Laboratory I (fall)
- EAPS 42200 - Atmospheric Dynamics I (spring)
- EAPS 43200 - Synoptic Laboratory II (spring)
- EAPS 53200 - Atmospheric Physics I (spring)
- EAPS 42300 - Atmospheric Dynamics II (fall)
- EAPS 43300 - Synoptic Lab III (fall)
- EAPS 53500 - Atmospheric Observations And Measurements (fall)

### Other Departmental/Program Course Requirements (70-77 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core) or

- MA 16600 - Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- MA 26500 - Linear Algebra (satisfies Quantitative Reasoning Selective for core)
- MA 26600 - Ordinary Differential Equations (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry ^ (satisfies Science Selective for core)
- CHM 11600 - General Chemistry ^ (satisfies Science Selective for core)
- PHYS 17200 - Modern Mechanics ^ (satisfies Science selective for core and Teambuilding Experience)
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)
- CS 15800 - C Programming (satisfies Teambuilding Experience)
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core)
- ENGL 10600 - First-Year Composition (satisfies Written Communication & Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication & Information Literacy for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language/Culture Elective I - Credit Hours: 3.00 - 4.00
- Language/Culture Elective II - Credit Hours: 3.00 - 4.00
- Language/Culture Elective III - Credit Hours: 3.00 - 4.00
- General Education Elective I (Select courses could satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education Elective II (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective III (Select courses could satisfy Humanities Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00
- Multidisciplinary Elective (could be satisfied by Science, Technology & Society core classes)

## Electives (16 credits -- or more if needed to reach 120 credits of countable credits)

Recommend Science, Technology & Society core course as one elective

## 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

## Program Requirements

[http://www.eaps.purdue.edu/for\\_students/undergraduate/](http://www.eaps.purdue.edu/for_students/undergraduate/)

## Fall 1st Year

- EAPS 10900 - The Dynamic Earth ^ (fall only) \*
- MA 16100 - Plane Analytic Geometry And Calculus I ^\*
- CHM 11500 - General Chemistry ^\*
- ENGL 10600 - First-Year Composition (1st or 2nd sem) \*

16 Credits

## Spring 1st Year

- EAPS 11700 - Introduction To Atmospheric Science ^ (spring only) \*
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring only)
- MA 16200 - Plane Analytic Geometry And Calculus II ^\*
- CHM 11600 - General Chemistry ^\*
- Language & Culture - Credit Hours: 3.00

16 Credits

## Fall 2nd Year

- EAPS 22500 - Science Of The Atmosphere ^\*
- MA 26100 - Multivariate Calculus \*
- PHYS 17200 - Modern Mechanics ^\*
- Language & Culture - Credit Hours: 3.00

14 Credits

## Spring 2nd Year

- EAPS 32000 - Physics Of Climate calc; physics co preq
- MA 26500 - Linear Algebra \*
- PHYS 27200 - Electric And Magnetic Interactions
- COM 21700 - Science Writing And Presentation
- Language & Culture - Credit Hours: 3.00

16 Credits

## Fall 3rd Year

- EAPS 42100 - Atmospheric Thermodynamics
- EAPS 43100 - Synoptic Laboratory I
- MA 26600 - Ordinary Differential Equations \*
- CS - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

16 Credits

## Spring 3rd Year

- EAPS 42200 - Atmospheric Dynamics I
- EAPS 43200 - Synoptic Laboratory II
- EAPS 53200 - Atmospheric Physics I
- STAT Elective - Credit Hours: 3.00 \*
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

16 Credits

## Fall 4th Year

- EAPS 42300 - Atmospheric Dynamics II
- EAPS 43300 - Synoptic Lab III
- EAPS 53500 - Atmospheric Observations And Measurements
- Great Issues - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

13 Credits

## Spring 4th Year

- Multidisciplinary Elective - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 1.00

## 13 Credits

### Note

\*Satisfies a University Core Requirement

Students must earn a "C-" or better in all required ^ courses.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in EAPS major classes required to graduate.

### 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.

## Earth Space Science Education, BS

### About the Program

The earth/space science education program provides a broad earth science core; a strong background in math, chemistry, and physics; and courses in education covering student development, integration of content and teaching methods, use of technology, fostering community, and assessing outcomes. The Earth, Atmospheric, and Planetary Sciences (EAPS) Department has a low faculty-to-student ratio, which allows students to have a lot of one-on-one interaction with their professors. All undergraduates are encouraged to take part in research.

Earth/Space Science Education Website

#### Summary of Program Requirements



The Summary of Program Requirements for Earth-Space Science Education is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

code-BS  
Code-ESSE  
126+ Credits  
"C-" or better required in ^ courses

## Departmental/Program Major Courses (68-69)

### Required Major Courses (35 credits)

- EAPS 10900 - The Dynamic Earth ^ (fall) (also satisfies Science Selective for core)
- EAPS 11800 - Introduction To Earth Sciences ^ (spring)
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring)
- EAPS 24300 - Earth Materials I ^ (fall) (also satisfies Science Selective for core)
- EAPS 31900 - Exploring Earth Through Time (spring)
- EAPS 35300 - Earth Surface Processes (fall)
- EAPS 35400 - Plate Tectonics (spring)
- EAPS/ASTR Elective (could satisfy Science, Technology & Society for core) - link - Credit Hours: 3.00 +
- EAPS/ASTR Elective - Credit Hours: 3.00 +
- EAPS/ASTR Elective - Credit Hours: 3.00 +
- EAPS 49000 - Field Geology In Rocky Mountains (summer)
- EDCI 20500 - Exploring Teaching As A Career (satisfies Written Communication for core)
- EDCI 28500 - Multiculturalism And Education (counts as Culture Course/Human Cultures Humanities for core)
- EDPS 23500 - Learning And Motivation (counts as General Education Elective/Behavioral Social Sciences for core)
- EDPS 26500 - The Inclusive Classroom (satisfies Human Cultures Humanities for Core)
- EDCI 27000 - Introduction To Educational Technology And Computing (satisfies Information Literary for core)
- EDST 20000 - History And Philosophy Of Education (satisfies Human Cultures Humanities for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools
- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 49800 - Supervised Teaching

### + Select from

- EAPS 10400 - Oceanography
- EAPS 10500 - The Planets
- EAPS 11500 - Dinosaurs
- EAPS 11600 - Earthquakes And Volcanoes
- EAPS 12000 - Introduction To Geography

- EAPS 13800 - Thunderstorms And Tornadoes
- EAPS 22100 - Survey Of Atmospheric Science
- EAPS 22500 - Science Of The Atmosphere
- ASTR 26300 - Descriptive Astronomy: The Solar System
- ASTR 26400 - Descriptive Astronomy: Stars And Galaxies

## Other Departmental /Program Course Requirements (52-58 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core)
  
- MA 16200 - Plane Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core)
  
- CHM 11500 - General Chemistry ^ (satisfies Science Selective for core)
- CHM 11600 - General Chemistry ^ (satisfies Science Selective for core)
  
- PHYS 17200 - Modern Mechanics ^ (satisfies Science Selective for core and Teambuilding Experience- PHYS 17200 only) or
- PHYS 22000 - General Physics ^ (satisfies Science Selective for core and Teambuilding Experience- PHYS 17200 only)
  
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core) or
- PHYS 22100 - General Physics (satisfies Science Selective for core)
  
- CS 17700 - Programming With Multimedia Objects (satisfies Teambuilding Experience)
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core)
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication & Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication & Information Literacy for core)
  
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language/Culture Elective I - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective II - link - Credit Hours: 3.00 - 4.00
- General Education Elective I (Select courses could satisfy Human Culture Behavioral/Social Science for core)- link - Credit Hours: 3.00
- General Education Elective II (Select courses could satisfy Human Cultures Humanities for core)- link - Credit Hours: 3.00
- Great Issues - link - Credit Hours: 3.00
- Multidisciplinary Elective - link (fulfilled by ESSE Degree requirements) - Credit Hours: 0.00

## Electives (3 credits or more)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.eaps.purdue.edu/for\\_students/undergraduate/](http://www.eaps.purdue.edu/for_students/undergraduate/)

### Fall 1st Year

- EAPS 10900 - The Dynamic Earth ^ (fall only) \*
- MA 16100 - Plane Analytic Geometry And Calculus I ^\*
- CHM 11500 - General Chemistry ^\*
- ENGL 10600 - First-Year Composition (1st or 2nd sem) \*

### 16 Credits

### Spring 1st Year

- EAPS 11800 - Introduction To Earth Sciences ^ (spring only) \*
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^
- MA 16200 - Plane Analytic Geometry And Calculus II ^\*
- CHM 11600 - General Chemistry ^\*
- General Education Elective - Credit Hours: 3.00

### 16 Credits

### Fall 2nd Year

- EAPS 24300 - Earth Materials I ^ (fall only) \*
- PHYS 17200 - Modern Mechanics ^\* or
- PHYS 22000 - General Physics ^\*
- EAPS/ASTR Elective - Credit Hours: 3.00
- EDCI 20500 - Exploring Teaching As A Career

- EDCI 28500 - Multiculturalism And Education

14 Credits

### Spring 2nd Year

- EAPS 31900 - Exploring Earth Through Time (spring only)
- PHYS 27200 - Electric And Magnetic Interactions or
- PHYS 22100 - General Physics
- EDPS 23500 - Learning And Motivation
- EDPS 26500 - The Inclusive Classroom
- Free Elective - Credit Hours: 3.00

16 Credits

### Fall 3rd Year

- EAPS 35300 - Earth Surface Processes (fall only)
- STAT - Credit Hours: 3.00 \*
- C S - Credit Hours: 4.00
- COM 21700 - Science Writing And Presentation
- Language and Culture - Credit Hours: 3.00

16 Credits

### Spring 3rd Year

- EAPS 35400 - Plate Tectonics (spring only)
- EAPS/ASTR Elective - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00 \*
- Language and Culture - Credit Hours: 3.00
- EDCI 27000 - Introduction To Educational Technology And Computing

15 Credits

Summer

- EAPS 49000 - Field Geology In Rocky Mountains

## 6 Credits

### Fall 4th Year

- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools
- EAPS/ASTR Elective - Credit Hours: 3.00
- EDST 20000 - History And Philosophy Of Education
- General Education Elective - Credit Hours: 3.00

## 12 Credits

### Spring 4th Year

- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDCI 49800 - Supervised Teaching

## 15 Credits

## Note

\*Satisfies a University Core Requirement

Students must earn a "C-" or better in all required ^ courses.

120 semester credits (minimum) required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in EAPS major classes required to graduate.

## 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.

## Environmental Geoscience, BS

### About the Program

Using a background in geology or atmospheric science as their foundation, students can use an interdisciplinary approach to study ground-water contamination, landfill management, landslide risk, urban planning, climate change, and many other contemporary environmental issues. The Earth, Atmospheric, and Planetary Sciences (EAPS) Department has a low faculty-to-student ratio, which allows students to have a lot of one-on-one interaction with their professors. All undergraduates are encouraged to take part in research.

Environmental Geosciences Website

#### Summary of Program Requirements

The Summary of Program Requirements for Environmental Geoscience is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

code-BS  
Code-ENVG  
120 Credits  
"C-" or better required in ^ courses

### Departmental/Program Major Courses (48-49 credits)

#### Required Major Courses (48-49 credits)

- EAPS 10900 - The Dynamic Earth ^ (fall) (also satisfies Science Selective for core) or
- EAPS 11300 - Introduction To Environmental Science (also satisfies Science Selective for core)
  
- EAPS 11800 - Introduction To Earth Sciences ^ (spring)
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring)
- EAPS 22500 - Science Of The Atmosphere ^ (fall) (also satisfies Science Selective for core)
- Biogeochemistry Elective - Credit Hours: 3.00

- AGRY 33700 - Environmental Hydrology (spring)
- EAPS 30900 - Computer-Aided Analysis For Geosciences (spring)
- FNR 40600 - Natural Resource And Environmental Economics
- GIS Elective - Credit Hours: 3.00
  
- EAPS 44000 - Geochemistry Of Earth Elements or
- CE 35500 - Engineering Environmental Sustainability
  
- Environmental Elective - Credit Hours: 3.00
- EAPS xxxxx EAPS Environmental Elective (could satisfy Science, Technology & Society for core) - Credit Hours: 3.00
- EAPS xxxxx EAPS Environmental Elective - Credit Hours: 3.00
- EAPS xxxxx EAPS Environmental Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS xxxxx EAPS Environmental Elective (3xxxx and above) - Credit Hours: 3.00
- Capstone Research Experience - Credit Hours: 3.00
- Science/Engineering Elective (2xxxx or above) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (61-67 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core)
  
- MA 16200 - Plane Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core)
  
- CHM 11500 - General Chemistry ^ (satisfies Science Selective for core)
- CHM 11600 - General Chemistry ^ (satisfies Science Selective for core)
  
- BIOL 11000 - Fundamentals Of Biology I ^ (satisfies Science Selective for core; PHYS Teambuilding Experience) or
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior ^ (satisfies Science Selective for core; PHYS Teambuilding Experience) or
- PHYS 17200 - Modern Mechanics ^ (satisfies Science Selective for core; PHYS Teambuilding Experience) or
- PHYS 22000 - General Physics ^ (satisfies Science Selective for core; PHYS Teambuilding Experience)
  
- BIOL 11100 - Fundamentals Of Biology II (satisfies Science Selective for core) -must be same subject as above. or
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms (satisfies Science Selective for core) -must be same subject as above. or
- PHYS 22100 - General Physics (satisfies Science Selective for core) -must be same subject as above.
  
- CS 17700 - Programming With Multimedia Objects (satisfies Teambuilding Experience)
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core)
  
- ENGL 10600 - First-Year Composition (satisfies Written Communication & Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication & Information Literacy for core)
  
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)

- Language/Culture Elective I - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective II - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective III - link - Credit Hours: 3.00 - 4.00
- General Education Elective I (Select courses could satisfy Human Culture Behavioral/Social Science for core)- link - Credit Hours: 3.00
- General Education Elective II (Select courses could satisfy Human Cultures Humanities for core)- link - Credit Hours: 3.00
- General Education Elective III (Select courses could satisfy Humanities Behavioral/Social Science for core)- link - Credit Hours: 3.00
- Great Issues - link - Credit Hours: 3.00
- Multidisciplinary Elective - link (could be satisfied by Science, Technology & Society core classes) - Credit Hours: 3.00

Electives (6 credits or more if needed to reach 120 credits of countable credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.eaps.purdue.edu/for\\_students/undergraduate/](http://www.eaps.purdue.edu/for_students/undergraduate/)

### Fall 1st Year

- EAPS 10900 - The Dynamic Earth ^ (fall only) \*
- MA 16100 - Plane Analytic Geometry And Calculus I ^\*
- CHM 11500 - General Chemistry ^\*
- ENGL 10600 - First-Year Composition (1st or 2nd sem) \*

### 16 Credits

### Spring 1st Year



- EAPS 11800 - Introduction To Earth Sciences ^\*
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^
- MA 16200 - Plane Analytic Geometry And Calculus II ^\*
- CHM 11600 - General Chemistry ^\*
- Language & Culture - Credit Hours: 3.00

16 Credits

## Fall 2nd Year

- EAPS 22500 - Science Of The Atmosphere ^\*
- Lab Sequence II (part I) - Credit Hours: 4.00 ^
- General Education Elective - Credit Hours: 3.00
- Language & Culture - Credit Hours: 3.00

14 Credits

## Spring 2nd Year

- Biogeochemistry Elective - Credit Hours: 3.00
- Lab Sequence II (same subject as Part I) - Credit Hours: 4.00
- AGRY 33700 - Environmental Hydrology
- Language & Culture - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00

16 Credits

## Fall 3rd Year

- GIS Elective - Credit Hours: 3.00
- STAT - Credit Hours: 3.00 \*
- C S - Credit Hours: 4.00
- Science/Engr Elective - Credit Hours: 3.00
- Environmental Elective - Credit Hours: 3.00

16 Credits

## Spring 3rd Year

- EAPS 44000 - Geochemistry Of Earth Elements or
- CE 35500 - Engineering Environmental Sustainability
- EAPS 30900 - Computer-Aided Analysis For Geosciences
- Multidisciplinary Science Elective - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation

## 15 Credits

### Fall 4th Year

- EAPS Capstone Research - Credit Hours: 3.00
- EAPS Environmental Elective - Credit Hours: 3.00
- EAPS Environmental Elective - Credit Hours: 3.00
- FNR 40600 - Natural Resource And Environmental Economics
- Great Issues - Credit Hours: 3.00 \*
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Spring 4th Year

- EAPS Environmental Elective- Credit Hours: 3.00 <sup>b</sup>
- EAPS Environmental Elective- Credit Hours: 3.00 <sup>b</sup>
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective -( if needed) - Credit Hours: 3.00

## 12-15 Credits

## Note

\*Satisfies a University Core Requirement

<sup>b</sup>3xxx or above

Students must earn a "C-" or better in all required ^ courses.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in EAPS major classes required to graduate.

## 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.

## Geology and Geophysics, BS

## About the Program

Within the geology and geophysics major, students can select elective courses to focus their study on areas such as basin analysis, biogeochemistry, engineering geology, geochemistry, geomechanics, geomorphology, geophysics, hydrogeology, paleontology, planetary science, sedimentology/stratigraphy, structural geology, and tectonics. The Earth, Atmospheric, and Planetary Sciences (EAPS) Department has a low faculty-to-student ratio, which allows students to have a lot of one-on-one interaction with their professors. All undergraduates are encouraged to take part in research.

Geology and Geophysics Website

### Summary of Program Requirements

The Summary of Program Requirements for Geology and Geophysics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

code-BS  
Code-GEOP  
120 Credits  
"C-" or better required in ^ courses

## Departmental/Program Major Courses (49-50 credits)

## Required Major Courses (49-50 credits)

- EAPS 10900 - The Dynamic Earth ^ (fall) (also satisfies Science Selective for core)
- EAPS 11800 - Introduction To Earth Sciences ^ (spring)
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring)
- EAPS 24300 - Earth Materials I ^ (fall) (also satisfies Science Selective for core)
- EAPS 31900 - Exploring Earth Through Time (spring)
- EAPS 35300 - Earth Surface Processes (fall)
- EAPS 35400 - Plate Tectonics (spring)
- EAPS 30900 - Computer-Aided Analysis For Geosciences (spring)
- EAPS Elective (could satisfy Science, Technology & Society for core) - Credit Hours: 3.00
- EAPS xxxxx EAPS Professional Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS xxxxx EAPS Professional Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS xxxxx EAPS Professional Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS xxxxx EAPS Professional Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS 49000 - Field Geology In Rocky Mountains (summer)
- Science/Engineering Elective (2xxxx or above) - Credit Hours: 3.00
- Science/Engineering Elective (2xxxx or above) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (61-67 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core)
  
- MA 16200 - Plane Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core)
  
- CHM 11500 - General Chemistry ^ (satisfies Science Selective for core)
- CHM 11600 - General Chemistry ^ (satisfies Science Selective for core)
  
- PHYS 17200 - Modern Mechanics ^ (satisfies Science Selective for core and Teambuilding Experience) or
- PHYS 22000 - General Physics ^ (satisfies Science Selective for core and Teambuilding Experience)
  
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core) or
- PHYS 22100 - General Physics (satisfies Science Selective for core)
  
- CS 17700 - Programming With Multimedia Objects (satisfies Teambuilding Experience)
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core)
  
- ENGL 10600 - First-Year Composition (satisfies Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Information Literacy Selective for core)
  
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language/Culture Elective I - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective II - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective III - link - Credit Hours: 3.00 - 4.00

- General Education Elective I (Select courses could satisfy Human Culture Behavioral/Social Science for core)- link - Credit Hours: 3.00
- General Education Elective II (Select courses could satisfy Human Cultures Humanities for core)- link - Credit Hours: 3.00
- General Education Elective III (Select courses could satisfy Humanities Behavioral/Social Science for core)- link - Credit Hours: 3.00
- Great Issues - link - Credit Hours: 3.00
- Multidisciplinary Elective - link (could be satisfied by Science, Technology & Society core classes) - Credit Hours: 3.00

## Electives

(6 credits or more if needed to reach 120 credits of countable credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.eaps.purdue.edu/for\\_students/undergraduate/](http://www.eaps.purdue.edu/for_students/undergraduate/)

### Fall 1st Year

- EAPS 10900 - The Dynamic Earth ^ (fall only) \*
- MA 16100 - Plane Analytic Geometry And Calculus I ^\*
- CHM 11500 - General Chemistry ^\*
- ENGL 10600 - First-Year Composition (1st or 2nd sem) \*

### 16 Credits

### Spring 1st Year

- EAPS 11800 - Introduction To Earth Sciences ^\*
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^

- MA 16200 - Plane Analytic Geometry And Calculus II ^\*
- CHM 11600 - General Chemistry ^\*
- Language & Culture - Credit Hours: 3.00

## 16 Credits

### Fall 2nd Year

- EAPS 24300 - Earth Materials I ^\*
- PHYS 17200 - Modern Mechanics ^\* or
- PHYS 22000 - General Physics ^\*
- General Education Elective - Credit Hours: 3.00
- Language & Culture - Credit Hours: 3.00

## 14 Credits

### Spring 2nd Year

- EAPS 31900 - Exploring Earth Through Time
- PHYS 27200 - Electric And Magnetic Interactions or
- PHYS 22100 - General Physics
- COM 21700 - Science Writing And Presentation
- Language & Culture - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 16 Credits

### Fall 3rd Year

- EAPS 35300 - Earth Surface Processes
- STAT - Credit Hours: 3.00 \*
- C S - Credit Hours: 4.00
- Science/Engr Elective - Credit Hours: 3.00 <sup>a</sup>

## 13 Credits

## Spring 3rd Year

- EAPS 35400 - Plate Tectonics
- EAPS 30900 - Computer-Aided Analysis For Geosciences
- Great Issues - Credit Hours: 3.00 \*
- Science/Engr Elective - Credit Hours: 3.00 <sup>a</sup>
- EAPS Elective - Credit Hours: 3.00

15 Credits

## Summer

- EAPS 49000 - Field Geology In Rocky Mountains

6 Credits

## Fall 4th Year

- EAPS Professional Elective - Credit Hours: 3.00 <sup>b</sup>
- EAPS Professional Elective - Credit Hours: 3.00 <sup>b</sup>
- Multidisciplinary Elective - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Free Elective(-if needed) - Credit Hours: 3.00

12-15 Credits

## Spring 4th Year

- EAPS Professional Elective - Credit Hours: 3.00 <sup>b</sup>
- EAPS Professional Elective - Credit Hours: 3.00 <sup>b</sup>
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

12 Credits

## Note

\*Satisfies a University Core Requirement

<sup>a</sup>20000 level or above

<sup>b</sup>30000 level or above

Students must earn a "C-" or better in all required ^ courses.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in EAPS major classes required to graduate.

## 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.

## Planetary Sciences, BS

## About the Program

Within the planetary sciences multidisciplinary major, students can select elective courses to focus their study on specific areas such as planetary geology, planetary atmospheres, astrobiology or astronomy. The Earth, Atmospheric, and Planetary Sciences (EAPS) Department has a low faculty-to-student ratio, which allows students to have a lot of one-on-one interaction with their professors. All undergraduates are encouraged to take part in research.

[Planetary Sciences Website](#)

### Summary of Program Requirements

The Summary of Program Requirements for Planetary Sciences is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements



Please see below for detailed program requirements and possible selective fulfillments.

code-BS  
Code-PLSI  
120 Credits  
"C-"or better required in ^ courses

## Departmental/Program Major Courses (39-40 credits)

### Required Major Courses (33-34 credits)

- EAPS 10500 - The Planets ^ (also satisfies Science Selective for core)
- EAPS 10900 - The Dynamic Earth ^ or
- EAPS 11100 - Physical Geology ^ or
- EAPS 11200 - Earth Through Time ^ or
- EAPS 11700 - Introduction To Atmospheric Science ^ or
- EAPS 11800 - Introduction To Earth Sciences ^ or
- EAPS 22500 - Science Of The Atmosphere ^
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^ (spring)
- EAPS Elective (could satisfy Science, Technology & Society for core) - link - Credit Hours: 3.00
- ASTR 36300 - The Solar System (fall)
- EAPS 55600 - Planetary Geology
- AAE 45000 - Spacecraft Design
- Planetary Science Core Elective - Credit Hours: 3.00
- Planetary Science Core Elective - Credit Hours: 3.00
- EAPS Planetary Science Elective ( 3xxxx and above) - Credit Hours: 3.00
- EAPS Planetary Science Elective (3xxxx and above) - Credit Hours: 3.00
- EAPS Planetary Science Elective (3xxxx and above) - Credit Hours: 3.00
- Science/Engineering Elective (based on areas of interest) - Credit Hours: 3.00
- Science/Engineering Elective (based on areas of interest) - Credit Hours: 3.00

### Other Departmental /Program Course Requirements (68-75 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I ^ (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II ^ (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- MA 26200 - Linear Algebra And Differential Equations (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry ^ (satisfies Science Selective for core)
- CHM 11600 - General Chemistry ^ (satisfies Science Selective for core)
- PHYS 17200 - Modern Mechanics ^ (satisfies Science Selective for core and Teambuilding Experience)

- PHYS 27200 - Electric And Magnetic Interactions (satisfies Science Selective for core)
- CS 15800 - C Programming (satisfies Teambuilding Experience) or
- CS 17700 - Programming With Multimedia Objects (satisfies Teambuilding Experience)
- STAT 30100 - Elementary Statistical Methods (satisfies Information Literacy Selective for core)
- ENGL 10600 - First-Year Composition (satisfies Written Communication & Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication & Information Literacy for core)
- COM 21700 - Science Writing And Presentation (satisfies Oral Communication for core)
- Language/Culture Elective I - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective II - link - Credit Hours: 3.00 - 4.00
- Language/Culture Elective III - link - Credit Hours: 3.00 - 4.00
- General Education Elective I (Select courses could satisfy Human Culture Behavioral/Social Science for core)- link - Credit Hours: 3.00
- General Education Elective II (Select courses could satisfy Human Cultures Humanities for core)- link - Credit Hours: 3.00
- General Education Elective III (Select courses could satisfy Humanities Behavioral/Social Science for core)- link - Credit Hours: 3.00
- Great Issues - link - Credit Hours: 3.00
- Multidisciplinary Elective - link (could be satisfied by Science, Technology & Society core classes) - Credit Hours: 3.00

## Electives

(6 credits or more if needed to reach 120 credits of countable credits) - link

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.eaps.purdue.edu/for\\_students/undergraduate/](http://www.eaps.purdue.edu/for_students/undergraduate/)

## Fall 1st Year

- EAPS 10500 - The Planets ^\*
- MA 16100 - Plane Analytic Geometry And Calculus I ^\*
- CHM 11500 - General Chemistry ^\*
- ENGL 10600 - First-Year Composition (1st or 2nd sem) \*

16 Credits

### Spring 1st Year

- EAPS Introductory Course - Credit Hours: 3.00 ^
- EAPS 13700 - Freshman Seminar In Earth And Atmospheric Sciences ^
- MA 16200 - Plane Analytic Geometry And Calculus II ^\*
- CHM 11600 - General Chemistry ^\*
- Language & Culture - Credit Hours: 3.00

16 Credits

### Fall 2nd Year

- MA 26100 - Multivariate Calculus ^\*
- PHYS 17200 - Modern Mechanics ^\*
- General Education Elective - Credit Hours: 3.00
- Language & Culture - Credit Hours: 3.00

15 Credits

### Spring 2nd Year

- EAPS Elective - Credit Hours: 3.00
- MA 26200 - Linear Algebra And Differential Equations
- PHYS 27200 - Electric And Magnetic Interactions
- COM 21700 - Science Writing And Presentation
- Language & Culture - Credit Hours: 3.00

16 Credits

### Fall 3rd Year

- Planetary Science Core Elective - Credit Hours: 3.00
- ASTR 36300 - The Solar System
- STAT - Credit Hours: 3.00
- C S - Credit Hours: 3.00
- EAPS 55600 - Planetary Geology

## 15-16 Credits

### Spring 3rd Year

- Planetary Science Core Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00 \*
- Science/Engr Elective - Credit Hours: 3.00
- Science/Engr Elective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- Planetary Science Elective - Credit Hours: 3.00 <sup>a</sup>
- Planetary Science Elective - Credit Hours: 3.00 <sup>a</sup>
- Multidisciplinary Elective - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Spring 4th Year

- AAE 45000 - Spacecraft Design
- Planetary Science Elective - Credit Hours: 3.00 <sup>a</sup>
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 12 Credits

## Note

\*Satisfies a University Core Requirement

<sup>a</sup>Electives for advanced courses and specializations; 30000 level or above.

Students must earn a "C-" or better in all required ^ courses.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in EAPS major classes required to graduate.

## Degree Requirements

The student is ultimately responsible for knowing and completing all degree requirements.

Degree Works is knowledge source for specific requirements and completion

## 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.

## 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

## Minor

### **Earth, Atmospheric, and Planetary Sciences Minor**

The following courses describe the minimum coursework necessary to earn a minor in Earth, Atmospheric, and Planetary Sciences.

ALL COURSES FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY

#### Requirements for the Minor

- EAPS 11100 - Physical Geology
- EAPS 22100 - Survey Of Atmospheric Science or
- EAPS 22500 - Science Of The Atmosphere
- EAPS 23000 - Laboratory In Atmospheric Science

## Note

A minor in Earth, Atmospheric & Planetary Science consists of at least 10 credit hours beyond the courses listed above.

No more than one of the courses taken to meet the requirement of at least 10 additional EAS credit hours may be at the 10000 level.

# Department of Mathematics

## Overview

The Department of Mathematics is one of seven departments making up Purdue's College of Science. The Department has an international reputation as an outstanding center for mathematical education, scholarship and research. Together with visiting researchers, its 65 professors provide it with active involvement in current developments in many major areas of mathematics. Faculty research interests can be found in the Faculty Research Areas list or in our Faculty directory.

The Department offers the Bachelor of Science, Master of Science and Doctor of Philosophy degrees. Also, the Department is closely associated with other programs, including Actuarial Science, Statistics, and Computer Science.

Please explore our website or contact us directly for more information about our undergraduate or graduate programs, faculty, research, job opportunities or information on how to support us. The annual department newsletter, PUview, is a good place to read about Departmental news.

### Actuarial Science Program

The Purdue Actuarial Science Program is an interdisciplinary program offered jointly by the Department of Mathematics and Department of Statistics.

The program offers a major in Actuarial Science that prepares students for an actuarial career as well as providing complete preparation for the first five exams set by the Society of Actuaries and the Casualty Actuarial Society. Students receive an Actuarial Science Degree, a Statistics Degree, and a Management Minor. We do not offer graduate degrees in Actuarial Science. For more information contact Julie Morris.

### Program Information

- [Admissions Information \(Includes application forms and online application\)](#)
- [Actuarial Sciences Faculty](#)
- [Purdue Exam Awards \(and Application\)](#)
- [SOA Exam Applications](#)
- [Purdue Actuarial Club](#)

### Links

- [BeAnActuary.org](#)
- [Actuary.com](#)
- [Society of Actuaries](#)
- [Casualty Actuarial Society](#)
- [American Academy of Actuaries](#)
- [Conference of Consulting Actuaries](#)

- American Society of Pension Professionals & Actuaries
- Canadian Institute of Actuaries
- Institute of Actuaries (UK)
- International Actuarial Association (IAA)
- Purdue Department of Statistics
- Purdue Department of Mathematics
- Undergraduate Mathematics Information
- Undergraduate Statistics Information

## Faculty

<http://www.math.purdue.edu/people/faculty/>

## Contact Information

The Department's Main Office (Room 835 of the MATH building) is open from eight am to five pm on all weekdays, except University holidays. A phone number for the department is (765) 494-1901. The full address is:

Department of Mathematics  
Purdue University  
150 North University Street  
West Lafayette, Indiana 47907-2067

## Graduate Information

For Graduate Information please see Mathematics Graduate Program Information .

## Baccalaureate

## Actuarial Science Honors, BS

## About the Program

### Actuarial Science Program

Actuarial Science is a joint program of Mathematics and Statistics that emphasizes course work in Mathematics, Statistics, Economics, and Management. Students can prepare for four to five of the nine course exams to become an actuary and also will be eligible for all three VEEs (Validation by Educational Experience) upon successful completion of all required and recommended courses. In addition, most students also earn a second major in Statistics and a minor in Management.

Actuarial Science Website

### Summary of Program Requirements

The Summary of Program Requirements for Actuarial Science Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-ASHO

## Departmental/Program Major Courses (96-115 credits)

### Required Major Courses (51 credits)

Average GPA in courses must be 2.50 AND A or B in major courses excluding MGMT 20000 and MGMT 20100 AND 3.5

Average GPA in \* major courses

- MA 35100 - Elementary Linear Algebra
- MA 37300 - Financial Mathematics (satisfies Multidisciplinary) ♦
  
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
  
- STAT 47201 - Actuarial Models- Life Contingencies •
- STAT 41700 - Statistical Theory •
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives •
- MA 36600 - Ordinary Differential Equations
- STAT 47900 - Loss Models •
- STAT 51200 - Applied Regression Analysis
- STAT 42000 - Introduction To Time Series
- MGMT 20000 - Introductory Accounting
- MGMT 20100 - Management Accounting I
  
- MGMT 31000 - Financial Management or
- MGMT 30400 - Introduction To Financial Management
  
- MGMT 41100 - Investment Management
- ECON 25100 - Microeconomics (satisfies General Education Selective)
- ECON 25200 - Macroeconomics

### Program Requirement (0 credits)

Documentation of passing two exams given by the Society of Actuaries

- Exam 1 - Credit Hours: 0.00
- Exam 2 - Credit Hours: 0.00



## Other Departmental /Program Course Requirements (45-64credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
  
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16500 - Analytic Geometry And Calculus I

## Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

## Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus

- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

## Electives (5-24 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA - Credit Hours: 2.00 or
- STAT 17000 - Introduction To Actuarial Science
- Free Elective - Credit Hours: 3.00

### 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00

- MA 37300 - Financial Mathematics ♦
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 1.00

## 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- MGMT 20000 - Introductory Accounting
- ECON 25100 - Microeconomics
- STAT 35000 - Introduction To Statistics
- Language Selective III - Credit Hours: 3.00

## 16-17 Credits

### Spring 2nd Year

- MA 35100 - Elementary Linear Algebra
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
- MGMT 20100 - Management Accounting I
- ECON 25200 - Macroeconomics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 2.00 or
- STAT 25000 - Problems Solving In Probability

## 17 Credits

### Fall 3rd Year

- STAT 47201 - Actuarial Models- Life Contingencies •
- STAT 41700 - Statistical Theory •
- MGMT 31000 - Financial Management or
- MGMT 30400 - Introduction To Financial Management

- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 2.00

## 15-16 Credits

### Spring 3rd Year

- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives •
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- General Education I Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 4th Year

- MA 36600 - Ordinary Differential Equations
- STAT 51200 - Applied Regression Analysis
- MGMT 41100 - Investment Management
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 4th Year

- STAT 42000 - Introduction To Time Series
- Great Issue Selective
- General Education II Selective - Credit Hours: 3.00
- STAT 47900 - Loss Models •
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Note

Students must earn a 2.5 average GPA among required MA/STAT/MGMT/ECON courses excluding Calculus I, II, and III

AND A or B in major courses excluding MGMT 20000 and 20100 AND 3.5 Average GPA in • major courses

120 semester credits required for Bachelor of Science degree.

3.3 Graduation GPA required for Bachelor of Science degree.

## 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.

## Actuarial Science, BS

# About the Program

Actuarial Science is a joint program of Mathematics and Statistics that emphasizes coursework in Mathematics, Statistics, Economics, and Management. Students can prepare for four to five of the nine course exams to become an actuary and also will be eligible for all three VEEs (Validation by Educational Experience) upon successful completion of all required and recommended courses. In addition, most students also earn a second major in Statistics and a minor in Management.

Actuarial Science Website

### Summary of Program Requirements

The Summary of Program Requirements for Actuarial Science is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

## Departmental/Program Major Courses (90-109 credits)

### Required Major Courses (45 credits)

Average GPA in courses must be 2.50

- MA 35100 - Elementary Linear Algebra
- MA 37300 - Financial Mathematics (satisfies Multidisciplinary) ♦
  
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
  
- STAT 47201 - Actuarial Models- Life Contingencies
- STAT 41700 - Statistical Theory
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives
- MA 36600 - Ordinary Differential Equations
- STAT 51200 - Applied Regression Analysis
- STAT 42000 - Introduction To Time Series
- MGMT 20000 - Introductory Accounting
- MGMT 20100 - Management Accounting I
  
- MGMT 31000 - Financial Management or
- MGMT 30400 - Introduction To Financial Management
  
- ECON 25100 - Microeconomics (satisfies General Education Selective)
- ECON 25200 - Macroeconomics

### Other Departmental /Program Course Requirements (45-64credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
  
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00

- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16500 - Analytic Geometry And Calculus I

## Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

## Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

## Electives (11-30 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1

- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA - Credit Hours: 2.00 or
- STAT 17000 - Introduction To Actuarial Science
- Free Elective - Credit Hours: 3.00

### 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- MA 37300 - Financial Mathematics ♦
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 1.00

### 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- MGMT 20000 - Introductory Accounting
- ECON 25100 - Microeconomics
- STAT 35000 - Introduction To Statistics



- Language Selective III - Credit Hours: 3.00 - 4.00

## 16-18 Credits

### Spring 2nd Year

- MA 35100 - Elementary Linear Algebra
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
- MGMT 20100 - Management Accounting I
- ECON 25200 - Macroeconomics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 2.00 or
- STAT 25000 - Problems Solving In Probability

## 17 Credits

### Fall 3rd Year

- STAT 47201 - Actuarial Models- Life Contingencies
- STAT 41700 - Statistical Theory
- MGMT 31000 - Financial Management or
- MGMT 30400 - Introduction To Financial Management
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 3rd Year

- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- General Education I Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Fall 4th Year

- MA 36600 - Ordinary Differential Equations
- STAT 51200 - Applied Regression Analysis
  
- Free Elective - Credit Hours: 3.00 or
- MGMT 41100 - Investment Management
  
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 4th Year

- STAT 42000 - Introduction To Time Series
- Great Issue Selective
- General Education II Selective - Credit Hours: 3.00
- Free Elective STAT 47900 - Loss Models
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Note

Students must earn a 2.5 average GPA among required MA/STAT/MGMT/ECON courses excluding Calculus I, II, and III.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

### 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.

## Applied Mathematics, BS

## About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upper-level classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

### Summary of Program Requirements

The Summary of Program Requirements for Applied Mathematics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-APMA

## Departmental/Program Major Courses (79-102 credits)

## Required Major Courses (43-46 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra ♦
- MA 36600 - Ordinary Differential Equations
  
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
  
- MA 35300 - Linear Algebra II With Applications
- CS 31400 - Numerical Methods
  
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
  
- MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences or
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or

- MA 51000 - Vector Calculus

### Applied Math Selective (3 credits)

- MA 42500 - Elements Of Complex Analysis or
- MA 42800 - Introduction To Fourier Analysis or
- MA 52000 - Boundary Value Problems Of Differential Equations or
- MA 52300 - Introduction To Partial Differential Equations or
- MA 52500 - Introduction To Complex Analysis

### Math/Statistics Selective (3 credits)

- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications or
- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 42500 - Elements Of Complex Analysis or
- MA 42800 - Introduction To Fourier Analysis

### Other Departmental /Program Course Requirements (36-56 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00

- Multidisciplinary Experience LINK (Select courses COULD satisfy Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (18-41 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00

### 15-17 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

### Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- STAT 35000 - Introduction To Statistics
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 3rd Year

- MA 36600 - Ordinary Differential Equations
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- General Education Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 3rd Year

- MA 35300 - Linear Algebra II With Applications
- Advance Calculus Selective - Credit Hours: 3.00

- CS 31400 - Numerical Methods
- General Education Selective I - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
- MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences or
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 4.00 - 6.00

## 15-18 Credits

### Spring 4th Year

- Applied Math Selective - Credit Hours: 3.00
- Math/Statistics Elective - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Note

Students must earn a 2.0 average in MATH/STAT/CS courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics Education, BS

### About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upper-level classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

#### Summary of Program Requirements

The Summary of Program Requirements for Mathematics Education is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MAED

## Departmental/Program Major Courses (101-115 credits)

### Required Major Courses (44-47 credits)

Average GPA in courses must be 2.50

- MA 35100 - Elementary Linear Algebra
- CS 17700 - Programming With Multimedia Objects (satisfies Computing Requirement)
- MA 46000 - Geometry
- MA 37500 - Introduction To Discrete Mathematics
  
- STAT 31100 - Introductory Probability or
- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
  
- MA 30100 - An Introduction To Proof Through Real Analysis
- STAT 35000 - Introduction To Statistics (satisfies Statistics Requirement)
- MA 36600 - Ordinary Differential Equations
  
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors

### Calculus I Selective - Select from (4-5 Credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus

- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

## MA Selective (3 credits)

MA Elective must be 300 level or higher (CANNOT be MA 37300, MA 30300, MA 30400, 402, 470). Approved courses can be found at LINK or MA 48400 (you must apply and be accepted for MA 48400 - see advisor for more details)

## Educational Program Course Requirements (33 credits)

Average GPA in courses must be 3.00 - no grade lower than C-

- EDCI 27000 - Introduction To Educational Technology And Computing
- EDCI 20500 - Exploring Teaching As A Career
- EDCI 28500 - Multiculturalism And Education (satisfies Behavior/Social Science for core) (satisfies Language III)
- EDPS 23500 - Learning And Motivation (satisfies Behavior/Social Science for core) (satisfies General Education Requirement)
- EDPS 26500 - The Inclusive Classroom (satisfies Behavior/Social Science for core)
- EDST 20000 - History And Philosophy Of Education (satisfies Humanities for core)
- EDCI 42500 - Teaching Of Mathematics In Secondary Schools (satisfies Multidisciplinary Requirement)
- EDCI 42600 - Teaching Mathematics In The Middle And Junior High School
- EDCI 49800 - Supervised Teaching (satisfies Teamwork Experience requirement)

## Other Departmental /Program Course Requirements (24-35 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK - Credit Hours: 6.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (5-19 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- EDCI 20500 - Exploring Teaching As A Career
- Free Elective - Credit Hours: 1.00

### 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- CS 17700 - Programming With Multimedia Objects
- Language II Selective - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 1.00
- EDCI 28500 - Multiculturalism And Education

### 15-17 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00

- MA 46000 - Geometry
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- EDCI 27000 - Introduction To Educational Technology And Computing
- Free Elective - Credit Hours: 3.00

## 16-18 Credits

### Spring 2nd Year

- MA 37500 - Introduction To Discrete Mathematics
- STAT 31100 - Introductory Probability
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 3rd Year

- MA 30100 - An Introduction To Proof Through Real Analysis
- MA 35100 - Elementary Linear Algebra
- EDPS 23500 - Learning And Motivation
- EDPS 26500 - The Inclusive Classroom
- Free Elective - Credit Hours: 4.00

## 16 Credits

### Spring 3rd Year

- STAT 35000 - Introduction To Statistics
- MA 36600 - Ordinary Differential Equations
- Great Issues Selective - Credit Hours: 3.00
- EDST 20000 - History And Philosophy Of Education
- General Education Selective I - Credit Hours: 3.00

## 16 Credits

### Fall 4th Year

- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
- MA Selective - Credit Hours: 3.00
- General Education Selective II - Credit Hours: 3.00
- EDCI 42500 - Teaching Of Mathematics In Secondary Schools
- Free Elective - Credit Hours: 3.00

15 Credits

## Spring 4th Year

- EDCI 42600 - Teaching Mathematics In The Middle And Junior High School
- EDCI 49800 - Supervised Teaching - Credit Hours: 10.00

12 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.5 average in MATH/STAT/CS courses required for major.

120 semester credits required for Bachelor of Science degree.

2.5 Graduation GPA required for Bachelor of Science degree.

\*For Licensing - Students must pass GATE C

## 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.

## Mathematics Honors, BS

### About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upper-level classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

#### Summary of Program Requirements

The Summary of Program Requirements for Mathematics Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MAHO

### Departmental/Program Major Courses (76-99 credits)

#### Required Major Courses (40-43 credits)

Average GPA in courses must be 2.00 AND Average GPA in MA 44000, MA 44200, and MA 45000 must be 3.5 or higher.

- MA 35100 - Elementary Linear Algebra ♦
- MA 36600 - Ordinary Differential Equations
- MA 34100 - Foundations Of Analysis or

- MA 44000 - Real Analysis Honors
- MA 35300 - Linear Algebra II With Applications
- MA 45000 - Algebra Honors
- MA Selective - LINK (if student takes MA 34100, he or she must take MA 44000 for this MA Selective) - Credit Hours: 3.00
- MA Selective - LINK (if student takes MA 36200 or MA 51000, he or she must take MA 44200 for this MA Selective) - Credit Hours: 3.00
- MA Selective - LINK - Credit Hours: 3.00

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

### Other Departmental /Program Course Requirements (36-56 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or



- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (21-44 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 4.00

## 15-18 Credits

## Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 2.00
- Free Elective - Credit Hours: 3.00

## 15-18 Credits

## Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- STAT 35000 - Introduction To Statistics
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 3rd Year

- MA 36600 - Ordinary Differential Equations
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- General Education Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 3rd Year

- MA 35300 - Linear Algebra II With Applications
- Advance Calculus Selective - Credit Hours: 3.00
- General Education Selective I - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- MA 45000 - Algebra Honors
- MA Selective - MA 44000 - Real Analysis Honors
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-18 Credits

### Spring 4th Year

- Math Selective - MA 44200 - Multivariate Analysis I Honors

- Math Selective - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/CS courses required for major AND

Average GPA in MA 44000, MA 44200, and MA 45000 must be 3.5 or higher.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics, BS

## About the Program

All classes for math majors beyond calculus have 40 students or fewer, and many upper-level classes have fewer than 25 students; all professors have office hours, so students have many opportunities for individual contact with their professors. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Mathematics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MATH

## Departmental/Program Major Courses (77-99 credits)

### Required Major Courses (40-43 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra ♦
- MA 36600 - Ordinary Differential Equations
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- MA 35300 - Linear Algebra II With Applications
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
- MA Selective - LINK - Credit Hours: 3.00
- MA Selective - LINK - Credit Hours: 3.00
- MA Selective - LINK - Credit Hours: 3.00

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

## Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

## Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

## Advance Calculus Selective

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

## Other Departmental /Program Course Requirements (37-56 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00

- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (21-43 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00

## 15-17 Credits

## Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teamwork Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 2.00
- Free Elective - Credit Hours: 3.00

## 15-18 Credits

## Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- STAT 35000 - Introduction To Statistics
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

## Fall 3rd Year

- MA 36600 - Ordinary Differential Equations
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- General Education Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00



- Free Elective - Credit Hours: 2.00

## 15 Credits

### Spring 3rd Year

- MA 35300 - Linear Algebra II With Applications
- Advance Calculus Selective - Credit Hours: 3.00
- General Education Selective I - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Fall 4th Year

- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
  
- MA Selective - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-18 Credits

### Spring 4th Year

- Math Selective - Credit Hours: 3.00
- Math Selective - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/CS courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics-Computer Science, BS

## About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upperlevel classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

### Summary of Program Requirements

The Summary of Program Requirements for Mathematics with Computer Sciences Option is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MACS

## **Departmental/Program Major Courses (79-102 credits)**

### **Required Major Courses (43-46 credits)**

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra ♦
- MA 37500 - Introduction To Discrete Mathematics
- MA 36600 - Ordinary Differential Equations
- CS 24000 - Programming In C
- CS 25100 - Data Structures And Algorithms
- CS 31400 - Numerical Methods

### **Calculus I Selective - Select from (4-5 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### **Calculus II Selective - Select from (4-5 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### **Calculus III Selective - Select from (4-5 credits)**

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### MACS Math Selective (6 credits)

- MA 35300 - Linear Algebra II With Applications or
- MA 38500 - Introduction To Logic or
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors

### MA/STAT Selective (3 credits)

- MA 34100 - Foundations Of Analysis or
- MA 36200 - Topics In Vector Calculus or
- MA 41600 - Probability or
- STAT 41600 - Probability or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 42500 - Elements Of Complex Analysis or
- MA 46200 - Elementary Differential Geometry or
- STAT 42000 - Introduction To Time Series or
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors or
- MA 44000 - Real Analysis Honors or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51800 - Advanced Discrete Mathematics

### CS Selective - (3 credits)

- CS 38100 - Introduction To The Analysis Of Algorithms or
- CS 33400 - Fundamentals Of Computer Graphics or
- CS 48300 - Introduction To The Theory Of Computation or
- CS 51400 - Numerical Analysis or
- CS 51500 - Numerical Linear Algebra or
- CS 52000 - Computational Methods In Optimization

### Other Departmental /Program Course Requirements (36-56 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective -LINK - Credit Hours: 3.00 - 4.00

- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (18-41 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦

- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective CS 17700 - Programming With Multimedia Objects

## 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- CS 18000 - Problem Solving And Object-Oriented Programming
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 1.00

## 15-17 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- STAT 35000 - Introduction To Statistics
- Language Selective III - Credit Hours: 3.00 - 4.00
- General Education Selective I - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-17 Credits

### Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- MA 37500 - Introduction To Discrete Mathematics
- COM 21700 - Science Writing And Presentation
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Fall 3rd Year

- MA 36600 - Ordinary Differential Equations
- CS 24000 - Programming In C
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

15-16 Credits

## Spring 3rd Year

- MACS Math Selective - Credit Hours: 3.00
- CS 25100 - Data Structures And Algorithms
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 6.00

15-16 Credits

## Fall 4th Year

- CS 31400 - Numerical Methods
- MA Selective I - Credit Hours: 3.00
- General Education Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 6.00

15 Credits

## Spring 4th Year

- MA/STAT Selective - Credit Hours: 3.00
- CS Selective - Credit Hours: 3.00
- Multidisciplinary - Credit Hours: 0.00 - 4.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00 - 6.00

15-18 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/CS courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics/Business, BS

## About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upper-level classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.



## Summary of Program Requirements

The Summary of Program Requirements for Business Mathematics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

Mathematics Website

MATH-BS  
Code-MABU

## Departmental/Program Major Courses (82-105 credits)

### Required Major Courses (49-52 credits)

Average GPA in courses must be 2.00

- MGMT 20000 - Introductory Accounting (satisfies General Education Selective)
- MA 35100 - Elementary Linear Algebra ♦
  
- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
  
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
  
- MA 35300 - Linear Algebra II With Applications
- MA 36600 - Ordinary Differential Equations
  
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
  
- STAT 51200 - Applied Regression Analysis

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### Option Course Selective I (6 credits)

- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- CS 31400 - Numerical Methods or
- STAT 41700 - Statistical Theory or
- STAT 51700 - Statistical Inference

### Option Course Selective II (6 credits)

- MA 37300 - Financial Mathematics or
- MGMT 30400 - Introduction To Financial Management or
- MGMT 31000 - Financial Management or
- MGMT 41100 - Investment Management or
- MGMT 54400 - Database Management Systems or
- MGMT 32300 - Principles Of Marketing

### Other Departmental /Program Course Requirements (33-53 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00

- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (15-38 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00

## 15-17 Credits

## Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

## Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- MGMT 20000 - Introductory Accounting
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-17 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- Option Course Selective I - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Fall 3rd Year

- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
  
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors

- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Spring 3rd Year

- MA 35300 - Linear Algebra II With Applications
- Option Course Selective I - Credit Hours: 3.00
- General Education Selective I - Credit Hours: 3.00
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 4th Year

- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
- MA 36600 - Ordinary Differential Equations
- Option Course Selective II - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 0.00 - 2.00

## 15-18 Credits

### Spring 4th Year

- Option Course Selective II - Credit Hours: 3.00
- STAT 51200 - Applied Regression Analysis
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/MGMT courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics/Operations Research, BS

## About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upper-level classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching
- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

### Summary of Program Requirements

The Summary of Program Requirements for Operations Research Mathematics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MAOR

## Departmental/Program Major Courses (79-102 credits)

### Required Major Courses (43-46 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra ♦
- MA 36600 - Ordinary Differential Equations
- MA 35300 - Linear Algebra II With Applications
- CS 31400 - Numerical Methods
  
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
  
- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
  
- STAT 41700 - Statistical Theory or
- STAT 51700 - Statistical Inference

### Calculus 1 Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### MA, CS, STAT Selective (3 credits)

- CS 52000 - Computational Methods In Optimization or
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors or
- MA 52300 - Introduction To Partial Differential Equations or
- MA 54300 - Ordinary Differential Equations And Dynamical Systems or
- STAT 42000 - Introduction To Time Series

### Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

### MAOR Math Selective (3 credits)

- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 52100 - Introduction To Optimization Problems or
- IE 33500 - Operations Research - Optimization

### Other Departmental /Program Course Requirements (36-56 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)



- Language I Selective -LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- STAT 35000 - Introduction To Statistics
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (18-41 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00

## 15-17 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- STAT 35000 - Introduction To Statistics
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-17 Credits

### Spring 2nd Year

- MA 41600 - Probability or
- STAT 41600 - Probability
- MA 35100 - Elementary Linear Algebra ♦
- General Education Selective I - Credit Hours: 3.00
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 3.00

## 15 Credits

## Fall 3rd Year

- STAT 41700 - Statistical Theory
- MA, CS, STAT Selective - Credit Hours: 3.00
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

## Spring 3rd Year

- Advance Calculus Selective - Credit Hours: 3.00
- CS 31400 - Numerical Methods
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

## Fall 4th Year

- MA 35300 - Linear Algebra II With Applications
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors
- General Education Selective - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-17 Credits

## Spring 4th Year

- MAOR Math Selective - Credit Hours: 3.00
- MA 36600 - Ordinary Differential Equations
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

- Free Elective - Credit Hours: 2.00

## 15 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/CS/IE courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Mathematics/Statistics, BS

## About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors are 40 students or less, and many upperlevel classes have fewer than 25 students. In addition, the math curriculum is flexible enough that students can take classes in other interest areas or pursue double major or a minor without too much difficulty. Math specializations include:

- Applied mathematics
- Business mathematics
- Mathematics
- Mathematics teaching

- Mathematics with computer sciences option
- Mathematics with statistics option
- Operations research

Important note: When applying for any specialization within Mathematics, select "Mathematics" as your major. You will have the opportunity to specialize as you progress through the curriculum.

Mathematics Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Mathematics with Statistics Option is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

MATH-BS  
Code-MASI

## Departmental/Program Major Courses (75-99 credits)

### Required Major Courses (42-46 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra ♦
- STAT 35000 - Introduction To Statistics (satisfies Statistics Requirement)
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
- MA 41600 - Probability or
- STAT 41600 - Probability or
- STAT 51600 - Basic Probability And Applications
- STAT 41700 - Statistical Theory or
- STAT 51700 - Statistical Inference
- STAT 51200 - Applied Regression Analysis
- MA 35300 - Linear Algebra II With Applications

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus
- MA 17400 - Multivariable Calculus
- MA 18200 - Honors Calculus II
- MA 27100 - Several Variable Calculus

### Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

### Advanced MA Selective (3-4 credits)

- MA 36600 - Ordinary Differential Equations or
- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 42500 - Elements Of Complex Analysis or
- MA 42800 - Introduction To Fourier Analysis or
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors or
- MA 52000 - Boundary Value Problems Of Differential Equations

### STAT Selective (3 credits)

- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments or
- STAT 42000 - Introduction To Time Series or

- IE 53000 - Quality Control

## Other Departmental /Program Course Requirements (33-53 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
- Language I Selective -LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (21-45 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

# Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00 ♦
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00

## 15-17 Credits

## Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

## Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00
- General Education Selective - Credit Hours: 3.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-17 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra ♦
- STAT 35000 - Introduction To Statistics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 6.00



## 15 Credits

### Fall 3rd Year

- MA 34100 - Foundations Of Analysis
- MA 41600 - Probability or
- STAT 41600 - Probability
  
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Spring 3rd Year

- Advance Calculus Selective - Credit Hours: 3.00
- STAT 41700 - Statistical Theory
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 4th Year

- Advanced MA Selective - Credit Hours: 3.00
- STAT 51200 - Applied Regression Analysis
- General Education Selective I - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-17 Credits

### Spring 4th Year

- MA 35300 - Linear Algebra II With Applications

- STAT Selective - Credit Hours: 3.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 6.00

## 15 Credits

## Note

Student should earn minimum of a B- see advisor for further details.

Students must earn a 2.0 average in MATH/STAT/IE courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Minor

### Mathematics Minor

### Pre-requisite Courses for Math Minor

To complete the required courses for the Mathematics minor, you will need to first complete the following pre-requisite courses [by completing the course or establishing credit]. These courses are not part of the Mathematics minor.

- MA 16100 - Plane Analytic Geometry And Calculus I or
- MA 16500 - Analytic Geometry And Calculus I
  
- MA 16200 - Plane Analytic Geometry And Calculus II or
- MA 16600 - Analytic Geometry And Calculus II
  
- MA 26100 - Multivariate Calculus

## Requirements for the Minor

The Mathematics Minor provides a strong background in mathematics for students majoring in some other discipline. To qualify for the minor, the following classes must be completed with a C- or better.

ALL COURSES FOR THIS MINOR LISTED BELOW MUST BE TAKEN AT PURDUE UNIVERSITY

To obtain a minor in Mathematics, the following courses must be completed.

No substitutions are allowed. A course can only be used in one area.

3 credits from AREA 1

3 credits from AREA 2

6-7 credits from AREA 3

The three courses used for Areas 2 and 3 cannot all be from the same group.

TOTAL CREDITS FOR MINOR: 12-13 credits

### Area 1

CHOOSE ONE COURSE

- MA 35100 - Elementary Linear Algebra
- MA 51100 - Linear Algebra With Applications
- MA 26500 - Linear Algebra [must be completed with a B- or better] \*
- MA 35300 - Linear Algebra II With Applications - [recommended for students with TR or CR for MA 26500]

### Area 2

CHOOSE ONE COURSE

- MA 45300 - Elements Of Algebra I (Algebra group)
- MA 45000 - Algebra Honors (Algebra group)
- MA 34100 - Foundations Of Analysis (Analysis group)
- MA 44000 - Real Analysis Honors (Analysis group)

### Area 3

CHOOSE TWO COURSES

Area 3 Choices: in addition to courses listed below, approved mathematics selective courses can also be used:  
<http://www.math.purdue.edu/academic/undergrad/selectives>

## Group

### Analysis

- MA 30100 - An Introduction To Proof Through Real Analysis
- MA 34100 - Foundations Of Analysis
- MA 36200 - Topics In Vector Calculus
- MA 51000 - Vector Calculus

### Probability

[only one]

- MA 41600 - Probability or
- STAT 41600 - Probability or
- MA 51600 - Advanced Probability And Options With Numerical Methods or
- STAT 51600 - Basic Probability And Applications or
- MA 51900 - Introduction To Probability or
- STAT 51900 - Introduction To Probability

### Algebra

- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors

### Linear Algebra

- MA 35300 - Linear Algebra II With Applications

### Differential Equations

[only one]

- MA 36600 - Ordinary Differential Equations \*\* or
- MA 30300 - Differential Equations and Partial Differential Equations for Engineering and the Sciences or
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences

## Note

\*For many students, MA 26500 may not be adequate preparation for upper division mathematics classes. Students planning a Mathematics Minor should consider taking MA 35100 instead. Only students with a very firm grasp of the MA 26500 material [and a grade of B- or better] should contemplate taking MA 35300 without MA 35100

\*\* MA 26600 with at least a "B-" can be used in place of MA 36600 [only one of MA 26600/MA 36600/MA 30300/or MA 30400 can be used in Area 3]. MA 26200 will not be accepted for the minor.

## Department of Physics and Astronomy

### Overview

The Department of Physics and Astronomy serves the citizens of Indiana, the United States and the world through discovery that expands knowledge in the field of physics and closely related sciences, through conveyance of this knowledge to our students in an excellent learning environment, and through engagement in which we share our skills, knowledge, and enthusiasm with diverse communities beyond the University.

At present we have 58 faculty members, 62 postdocs and research scientists, 146 graduate students, and 196 undergraduate physics majors. These individuals conduct research across a broad spectrum of physics:

- Accelerator mass spectrometry
- Applied physics, experimental
- Astrophysics, experimental and theoretical
- Atomic, molecular, and optical (AMO) physics, experimental and theoretical
- Biophysics, experimental and theoretical
- Condensed matter physics, experimental and theoretical
- Geophysics, experimental
- High energy nuclear physics, experimental and theoretical
- High energy particle physics, experimental and theoretical
- Physics education
- Planetary physics

Our faculty members are recognized as world leaders in their respective fields. Included in our ranks are a member of the National Academy of Sciences, a winner of the Hamburg Prize for Theoretical Physics, the immediate past president of the National Association for Research in Science Teaching, 3 AAAS fellows, and 10 APS fellows.

On campus, the department occupies two buildings, the "Physics Building" (originally named the Charles Benedict Stuart Laboratory of Applied Physics) and an attached two-story subterranean laboratory complex containing offices, work rooms, and laboratories dedicated to accelerator mass spectrometry, the Purdue Rare Isotope Measurement Laboratory (PRIME Lab). We also make use of campus facilities in Purdue's Discover Park, particularly the Birck Nanotechnology Center and the Bindley Bioscience Center. Off campus, we participate in research that occurs at the Large Hadron Collider at CERN, Argonne National Laboratory, Brookhaven National Laboratory, Fermilab, the Stanford Linear Accelerator, and several observatories around the globe.

Our department has undergraduate programs in Physics, Honors Physics, Applied Physics, Applied Honors Physics, and Physics Teaching. We also have undergraduate minors in both Astronomy and Physics. Our graduate program offers both M.S. and PH.D. degrees with a wide variety of specializations.

Through our outreach programs we bring our love of physics to thousands of elementary and high school students and their teachers every year. Classroom visits are complete with demonstrations hands-on learning activities. Teachers receive high-quality, content-based professional development in our workshops and through summer research opportunities.

# Faculty

<http://www.physics.purdue.edu/people/index.php?type=facultyonly>

## Contact Information

### Mailing Address

Department of Physics and Astronomy  
525 Northwestern Avenue  
West Lafayette, IN 47907-2036

### Telephone and Fax

(765) 494-3000 (main office)  
(765) 494-2970 (undergraduate office)  
(765) 494-0706 (fax)

Department directory

### General questions

[physcontacts@purdue.edu](mailto:physcontacts@purdue.edu)

## Graduate Information

For Graduate Information please see [Physics and Astronomy Graduate Program Information](#).

## Baccalaureate

## Applied Physics Honors, BS

## About the Program

Purdue physics is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors average 30 or fewer students and are taught by professors actively engaged in forefront research. Undergraduate research is strongly encouraged and opportunities exist as early as the second semester to work in a research group. These groups include experimental and theoretical condensed matter physics, high energy physics, nano-physics, nuclear physics, astrophysics, biological physics, geophysics, relativity, and interdisciplinary areas of material science, engineering, or computational science.

The department also helps undergraduates with external internships, particularly for the summers. Upon graduation our students are accepted for graduate programs at many of the top universities and are also sought after for positions in industry, particularly high-tech positions. Our graduates have an exceptional record of career accomplishment in a wide variety of settings, including academia and major industrial and government labs.

The specialties under the applied physics curriculum can range from different areas. Individually tailored specialties may be chosen by the student in consultation with an advisor. Currently available specialties include:

- Geophysics and Atmospheric Sciences
- Astrophysics
- Computational Physics
- Nuclear Physics
- Material Science & Engineering
- Chemical Engineering
- Aeronautical & Astronautical Engineering
- Industrial Engineering
- Electrical and Computer Engineering
- Mechanical Engineering
- Medical Physics

In addition, many physics majors manage to complete dual or multiple major programs within the College of Science. This is possible because of a considerable overlap of the College of Science requirements. Popular dual majors with physics are: mathematics, computer science and chemistry.

Physics Website

### Summary of Program Requirements

The Summary of Program Requirements for Applied Physics Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

Physics - BS  
 APHO  
 ≥120 Credits for graduation Credits

## Applied Physics Honors Major Courses (64 - 71 credits)

### Required Major Courses (40 - 47 credits)

- PHYS 17200 - Modern Mechanics (also satisfies Science Selective for core and CoS teambuilding experience requirement)
- PHYS 27200 - Electric And Magnetic Interactions (also satisfies Science Selective for core)
- PHYS 30600 - Mathematical Methods Of Physics I (fall)  
or
- MA 36200 - Topics In Vector Calculus and
- MA 42500 - Elements Of Complex Analysis
- PHYS 30700 - Mathematical Methods Of Physics II (spring)  
or
- MA 35100 - Elementary Linear Algebra or
- MA 26500 - Linear Algebra

and

- MA 36600 - Ordinary Differential Equations or
- MA 26600 - Ordinary Differential Equations
  
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics (fall)
- PHYS 41000 - Physical Mechanics I Honors (fall)
- PHYS 41600 - Thermal And Statistical Physics Honors (fall)
- PHYS 42200 - Waves And Oscillations (spring)
- PHYS 43000 - Electricity And Magnetism I Honors (spring)
- PHYS 45000 - Intermediate Laboratory
- PHYS 46000 - Quantum Mechanics I Honors (fall)
- PHYS 59300 - Independent Research

Major Selective\* - (24 credits - in chosen applied area(s) approved by the Physics Department)

### Other Departmental /Program Course Requirements (41-68 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
  
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core)
  
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies Science Selective for core)
  
- CS 15800 - C Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 17700 - Programming With Multimedia Objects LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 18000 - Problem Solving And Object-Oriented Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement)
  
- STAT 30100 - Elementary Statistical Methods LINK (satisfies Information Literacy Selective for core) (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 35000 - Introduction To Statistics (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 50300 - Statistical Methods For Biology (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 51100 - Statistical Methods (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective)
  
- ENGL 10600 - First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement) or



- ENGL 10800 - Accelerated First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement)
- COM 21700 - Science Writing And Presentation LINK (satisfies Oral Communication for core and CoS technical writing and presenting requirement)
- Language I Selective -LINK - Credit Hours: 0.00 - 4.00
- Language II Selective - LINK - Credit Hours: 0.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 0.00 - 4.00
- General Education Elective I LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective II LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective III LINK (Select courses could satisfy Humanities Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues LINK (satisfies one of the Science/Engineering requirements for Physics Selective) - Credit Hours: 3.00
- Multidisciplinary Elective LINK (Select courses could satisfy Science, Technology & Society Selective for core) - Credit Hours: 0.00 - 3.00

## Electives ( $\leq 18$ credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

### Fall 1st Year

- PHYS 17200 - Modern Mechanics (HONORS) \*
- MA 16100 - Plane Analytic Geometry And Calculus I \*
- CHM 11500 - General Chemistry \*
- ENGL 10600 - First-Year Composition \*

17 Credits

## Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions (HONORS) \*
- CHM 11600 - General Chemistry \*
- MA 16200 - Plane Analytic Geometry And Calculus II \*
- LANGUAGE 101 - Credit Hours: 3.00 - 4.00

16-17 Credits

## Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics
- MA 26100 - Multivariate Calculus \*
- LANGUAGE 102 - Credit Hours: 3.00 - 4.00

15-16 Credits

## Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II
- PHYS 42200 - Waves And Oscillations
- LANGUAGE 201/culture - Credit Hours: 3.00 - 4.00
- STAT 30100 - Elementary Statistical Methods \*
- Elective - Credit Hours: 3.00

15-16 Credits

## Fall 3rd Year

- PHYS 41000 - Physical Mechanics I Honors
- PHYS 46000 - Quantum Mechanics I Honors
- PHYS 45000 - Intermediate Laboratory
- COM 21700 - Science Writing And Presentation \*
  
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

- Elective - Credit Hours: 1.00

## 15-16 Credits

### Spring 3rd Year

- PHYS 43000 - Electricity And Magnetism I Honors
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- General Ed (Humanities) - Credit Hours: 3.00 \*

## 15 Credits

### Fall 4th Year

- PHYS 41600 - Thermal And Statistical Physics Honors
- PHYS 59300 - Independent Research
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- General Ed (Humanities) - Credit Hours: 3.00 \*

## 16 Credits

### Spring 4th Year

- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- General Ed (Behav./Social Science ) - Credit Hours: 3.00 \*
- Multidisciplinary (STS) - Credit Hours: 3.00 \*

## 15 Credits

## Note

\*Satisfies a University Core Requirement

120 semester credits required for Bachelor of Science degree.

3.0 Graduation GPA required for Bachelor of Science degree.

3.0 average in PHYS/ASTR classes required to graduate.

No more than one C grade (i.e., C+, C, or C-) is allowed in all physics courses taken

No grade of D+ or worse is allowed in any course.

## 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.

## Applied Physics, BS

## About the Program

Purdue physics is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors average 30 or fewer students and are taught by professors actively engaged in forefront research. Undergraduate research is strongly encouraged and opportunities exist as early as the second semester to work in a research group. These groups include experimental and theoretical condensed matter physics, high energy physics, nano-physics, nuclear physics, astrophysics, biological physics, geophysics, relativity, and interdisciplinary areas of material science, engineering, or computational science.

The department also helps undergraduates with external internships, particularly for the summers. Upon graduation our students are accepted for graduate programs at many of the top universities and are also sought after for positions in industry, particularly high-tech positions. Our graduates have an exceptional record of career accomplishment in a wide variety of settings, including academia and major industrial and government labs.

The specialties under the applied physics curriculum can range from different areas. Individually tailored specialties may be chosen by the student in consultation with an advisor. Currently available specialties include:

- Geophysics and Atmospheric Sciences
- Astrophysics
- Computational Physics

- Nuclear Physics
- Material Science & Engineering
- Chemical Engineering
- Aeronautical & Astronautical Engineering
- Industrial Engineering
- Electrical and Computer Engineering
- Mechanical Engineering
- Medical Physics

In addition, many physics majors manage to complete dual or multiple major programs within the College of Science. This is possible because of a considerable overlap of the College of Science requirements. Popular dual majors with physics are: mathematics, computer science and chemistry.

Physics Website

### Summary of Program Requirements

The Summary of Program Requirements for Applied Physics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

Physics - BS  
APPH  
≥120 Credits for graduation Credits

## Applied Physics Major Courses (61 - 68 credits)

### Required Major Courses (37- 44 credits)

- PHYS 17200 - Modern Mechanics (also satisfies Science Selective for core and CoS teambuilding experience requirement)
- PHYS 27200 - Electric And Magnetic Interactions (also satisfies Science Selective for core)
- PHYS 30600 - Mathematical Methods Of Physics I (fall)  
or
- MA 36200 - Topics In Vector Calculus and
- MA 42500 - Elements Of Complex Analysis
- PHYS 30700 - Mathematical Methods Of Physics II (spring)  
or
- MA 35100 - Elementary Linear Algebra or
- MA 26500 - Linear Algebra  
and
- MA 36600 - Ordinary Differential Equations or
- MA 26600 - Ordinary Differential Equations

- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics (fall)
- PHYS 31000 - Intermediate Mechanics (fall)
- PHYS 33000 - Intermediate Electricity And Magnetism (fall)
- PHYS 36000 - Quantum Mechanics (spring)
- PHYS 42200 - Waves And Oscillations (spring)
- PHYS 45000 - Intermediate Laboratory
- PHYS 51500 - Thermal And Statistical Physics (spring)

Major Selective\* - (24 credits - in chosen applied area(s) approved by the Physics Department)

### Other Departmental /Program Course Requirements (41-68 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies Science Selective for core)
- CS 15800 - C Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 17700 - Programming With Multimedia Objects LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 18000 - Problem Solving And Object-Oriented Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement)
- STAT 30100 - Elementary Statistical Methods LINK (satisfies Information Literacy Selective for core) (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 35000 - Introduction To Statistics (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 50300 - Statistical Methods For Biology (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 51100 - Statistical Methods (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective)
- ENGL 10600 - First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement) or
- ENGL 10800 - Accelerated First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement)
- COM 21700 - Science Writing And Presentation LINK (satisfies Oral Communication for core and CoS technical writing and presenting requirement)

- Language I Selective -LINK - Credit Hours: 0.00 - 4.00
- Language II Selective - LINK - Credit Hours: 0.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 0.00 - 4.00
- General Education Elective I LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective II LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective III LINK (Select courses could satisfy Humanities Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues LINK (satisfies one of the Science/Engineering requirements for Physics Selective) - Credit Hours: 3.00
- Multidisciplinary Elective LINK (Select courses could satisfy Science, Technology & Society Selective for core) - Credit Hours: 0.00 - 3.00

## Electives ( $\leq 18$ credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

### Fall 1st Year

- PHYS 17200 - Modern Mechanics (HONORS) \*
- MA 16100 - Plane Analytic Geometry And Calculus I \*
- CHM 11500 - General Chemistry \*
- ENGL 10600 - First-Year Composition \*

### 17 Credits

### Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions (HONORS) \*
- CHM 11600 - General Chemistry \*
- MA 16200 - Plane Analytic Geometry And Calculus II \*
- LANGUAGE 101 - Credit Hours: 3.00 - 4.00

## 16-17 Credits

### Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics
- MA 26100 - Multivariate Calculus \*
- LANGUAGE 102 - Credit Hours: 3.00 - 4.00

## 15-16 Credits

### Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II
- PHYS 42200 - Waves And Oscillations
- LANGUAGE 201/culture - Credit Hours: 3.00 - 4.00
- STAT 30100 - Elementary Statistical Methods \*
- Elective - Credit Hours: 3.00

## 15-16 Credits

### Fall 3rd Year

- PHYS 31000 - Intermediate Mechanics
- PHYS 33000 - Intermediate Electricity And Magnetism
- PHYS 45000 - Intermediate Laboratory
- COM 21700 - Science Writing And Presentation \*
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## 15-16 Credits



## Spring 3rd Year

- PHYS 36000 - Quantum Mechanics
- PHYS 51500 - Thermal And Statistical Physics
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- General Ed (Humanities) - Credit Hours: 3.00 \*

15 Credits

## Fall 4th Year

- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00
- General Ed (Humanities) - Credit Hours: 3.00 \*

15 Credits

## Spring 4th Year

- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- Applied Physics Elective - Credit Hours: 3.00
- General Ed (Behav./Social Science ) - Credit Hours: 3.00 \*
- Multidisciplinary (STS) - Credit Hours: 3.00 \*

15 Credits

## Note

\*Satisfies a University Core Requirement

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in PHYS/ASTR classes required to graduate.

## 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.

## Physics Education, BS

## About the Program

This degree provides a strong background in physics, in addition to a license to teach physics at a high school and middle school level. The requirements for this degree are listed below. Additional guidelines are available at the Office of Professional Preparation and Licensure.

Since teacher certification requirements are determined by each individual state, a student will need to contact the state education licensing agency in state(s) where he or she plans to teach. Prospective teachers are exempt from the second year of the foreign language requirement, provided they successfully complete the professional semester within the baccalaureate program. The professional semester is the one that includes six weeks of a methods course at Purdue and 10 weeks of teaching.

To receive a Bachelor of Science with a major in physics teaching, a student must maintain a grade-point average of 2.5 or above in the physics education content area, and 3.0 or above in education courses required to meet licensing requirements.

**THE FOLLOWING 36 CREDIT HOURS OF EDUCATION COURSES ARE REQUIRED FOR CERTIFICATION TO TEACH PHYSICS IN INDIANA HIGH SCHOOLS.**

- Introduction to Educational Technology and Computing: EDCI 27000. 3 cr.
- Reading in Middle and Secondary Schools: Methods and Problems EDCI 30900. 3 cr.
- Educational Policies And Laws EDST 20010. 1 cr.
- Assessment Literacy EDPS 32700. 2 cr.
- Exploring Teaching as a Career: EDCI 20500. 3 cr.
- Multiculturalism and Education: EDCI 28500. 3 cr.
- Learning and Motivation: EDPS 23500. 3 cr.
- The Inclusive Classroom: EDPS 26500. 3 cr.
- The Teaching of Earth/Physical Science in the Secondary Schools: EDCI 42400. 3 cr.
- Teaching Science in the Middle and Junior High School: EDCI 42800. 2 cr.
- Supervised Teaching: EDCI 49800. 10 cr.

Physics Website

### Summary of Program Requirements

The Summary of Program Requirements for Physics Education is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

Physics Teaching- BS  
PHED  
≥120 Credits for graduation Credits

## Physics Education Major Courses (46-47 credits)

### Required Major Courses (34 credits)

- PHYS 17200 - Modern Mechanics (also satisfies Science Selective for core and CoS teambuilding experience requirement)
- PHYS 27200 - Electric And Magnetic Interactions (also satisfies Science Selective for core)
- PHYS 30600 - Mathematical Methods Of Physics I (fall)
- PHYS 30700 - Mathematical Methods Of Physics II (spring)
- PHYS 31000 - Intermediate Mechanics (fall)
- PHYS 33000 - Intermediate Electricity And Magnetism (fall)
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics (fall)
- PHYS 36000 - Quantum Mechanics (spring)
- PHYS 42200 - Waves And Oscillations (spring)
- PHYS 45000 - Intermediate Laboratory

### Major Selective\* - (12-13 credits)

- PHYS/ASTR ≥300 level - Credit Hours: 3.00
- PHYS 53600 - Electronic Techniques For Research (spring) or
- PHYS 58000 - Computational Physics (spring)
- Science/Engineering ≥300 level (could be met by CoS statistics requirement) - Credit Hours: 3.00
- Science/Engineering ≥300 level (could be met by CoS Great Issues requirement) - Credit Hours: 3.00

### Other Departmental /Program Course Requirements (41-68 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core) or

- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies Science Selective for core)
- CS 15800 - C Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 17700 - Programming With Multimedia Objects LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 18000 - Problem Solving And Object-Oriented Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement)
- STAT 30100 - Elementary Statistical Methods LINK (satisfies Information Literacy Selective for core) (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 35000 - Introduction To Statistics (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 50300 - Statistical Methods For Biology (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 51100 - Statistical Methods (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective)
- ENGL 10600 - First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement) or
- ENGL 10800 - Accelerated First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement)
- COM 21700 - Science Writing And Presentation LINK (satisfies Oral Communication for core and CoS technical writing and presenting requirement)
- Language I Selective -LINK - Credit Hours: 0.00 - 4.00
- Language II Selective - LINK - Credit Hours: 0.00 - 4.00
- Language and Culture III Selective -LINK (Select courses COULD satisfy Human Cultures Humanities for core-could be met by EDCI 28500) - Credit Hours: 0.00 - 4.00
- General Education Elective I LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective II LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective III LINK (Select courses could satisfy Humanities Behavioral/Social Science for core- can be met by EDPS 23500) - Credit Hours: 3.00
- Great Issues LINK (satisfies one of the Science/Engineering requirements for Physics Selective) - Credit Hours: 3.00
- Multidisciplinary Elective LINK (Select courses could satisfy Science, Technology & Society Selective for core) - Credit Hours: 0.00 - 3.00

## Professional Education Requirements (36 credits)

- EDCI 27000 - Introduction To Educational Technology And Computing (satisfies Information Literacy for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems
- EDST 20000 - History And Philosophy Of Education (Satisfies Human Cultures Humanities for core)
- EDCI 20500 - Exploring Teaching As A Career (Satisfies Written Communication for core)

- EDCI 28500 - Multiculturalism And Education (Satisfies Humanities Behavioral/Social Science for core and CoS language/culture requirement)
- EDPS 23500 - Learning And Motivation (Satisfies Humanities Behavioral/Social Science for core and CoS General Education requirement)
- EDPS 26500 - The Inclusive Classroom
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools (fall) (also meets CoS Multidisciplinary Requirement)
- EDCI 42800 - Teaching Science In The Middle And Junior High School (spring)
- EDCI 49800 - Supervised Teaching (also meets CoS Teambuilding Experience Requirement)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

### Fall 1st Year

- PHYS 17200 - Modern Mechanics (HONORS) \* ^
- MA 16100 - Plane Analytic Geometry And Calculus I \* ^
- CHM 11500 - General Chemistry \*
- ENGL 10600 - First-Year Composition \*

17 Credits

### Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions (HONORS) \* ^
- CHM 11600 - General Chemistry \* ^
- MA 16200 - Plane Analytic Geometry And Calculus II \*
- EDCI 27000 - Introduction To Educational Technology And Computing \*

16 Credits

## Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I ^
- PHYS 34000 - Modern Physics Laboratory ^
- PHYS 34400 - Modern Physics ^
- MA 26100 - Multivariate Calculus \*
- LANGUAGE 101 - Credit Hours: 3.00 - 4.00

## 15-16 Credits

## Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II ^
- PHYS 42200 - Waves And Oscillations ^
- STAT 30100 - Elementary Statistical Methods (Sci/Engr Selective) \*
- EDCI 20500 - Exploring Teaching As A Career \*
- EDCI 28500 - Multiculturalism And Education (Culture) \*
- LANGUAGE 102 - Credit Hours: 3.00 - 4.00

## 18-19 Credits

## Fall 3rd Year

- PHYS 31000 - Intermediate Mechanics ^
- PHYS 33000 - Intermediate Electricity And Magnetism ^
- PHYS 45000 - Intermediate Laboratory ^
- EDPS 23500 - Learning And Motivation (General Education) \*
- EDPS 26500 - The Inclusive Classroom
- General Ed (Humanities) - Credit Hours: 3.00 \*

## 18 Credits

## Spring 3rd Year

- PHYS 36000 - Quantum Mechanics ^
- PHYS 53600 - Electronic Techniques For Research or
- PHYS 58000 - Computational Physics
- COM 21700 - Science Writing And Presentation
- General Ed (Humanities) - Credit Hours: 3.00 \*

- EDST 20000 - History And Philosophy Of Education \*

## 15-16 Credits

### Fall 4th Year

- PHYS/ASTR  $\geq$  300 level - Credit Hours: 3.00
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools (Multidisciplinary)
- Great Issues (Sci/Engr selective) - Credit Hours: 3.00
  
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects

## 15-16 Credits

### Spring 4th Year

- EDCI 42800 - Teaching Science In The Middle And Junior High School
- EDCI 49800 - Supervised Teaching (team experience) - Credit Hours: 10.00
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems

## 15 Credits

### Note

\*Satisfies a University Core Requirement

$\geq$ 120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in PHYS/ASTR classes required to graduate.

2.5 average in Physics Content courses required to graduate (those denoted by ^)

3.0 average in Professional Education courses required to graduate ( No grade below a C- )

## 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.

## Physics Honors, BS

### About the Program

Purdue physics is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors average 30 or fewer students and are taught by professors actively engaged in forefront research. Undergraduate research is strongly encouraged and opportunities exist as early as the second semester to work in a research group. These groups include experimental and theoretical condensed matter physics, high energy physics, nano-physics, nuclear physics, astrophysics, biological physics, geophysics, relativity, and interdisciplinary areas of material science, engineering, or computational science.

The department also helps undergraduates with external internships, particularly for the summers. Upon graduation our students are accepted for graduate programs at many of the top universities and are also sought after for positions in industry, particularly high-tech positions. Our graduates have an exceptional record of career accomplishment in a wide variety of settings, including academia and major industrial and government labs.

The honors program offers an intensive concentration in physics that provides a solid foundation for advanced studies. Successful graduates of this challenging program are recognized for both the depth and breadth of their physics education, and they have gone on to the premier graduate schools in the country and ultimately to many different career choices.

The honors program provides a solid theoretical and experimental background in mechanics, electromagnetism, waves and oscillations, thermal physics, quantum mechanics, and the micro-structure of matter.

A very important feature of this plan is a senior research project (PHYS 59300) with a written report in some area of modern physics, such as condensed matter physics, nuclear physics, elementary particle physics, biophysics, geophysics, etc. Students receive individual supervision and guidance from a faculty member whose specialty matches the area of their research project. PHYS 593 introduces students to the type of research atmosphere they later might encounter as professional physicists, and it promotes self-motivation and independence in their work.

The Honors Program in the Department of Physics and Astronomy begins in the Junior Year. All physics majors typically start by taking PHYS 172H and 272H as freshmen. Students from other majors who have taken PHYS 172/272 may switch into the Honors Physics major. Admission to, and continuation in, the honors program requires that all the core courses (PHYS 17200, 27200, 30600, 30700, 34400, 34000, and 42200) be complete with a B or better, or special permission from the Physics Undergraduate Committee.

The following stipulations need to be met in order to be in, stay in and graduate in the Honors or Applied Honors Program :

- No D+ or worse grade is allowed in any course for a student to stay in the Honors Programs.



- No more than one C range grade is allowed in all physics courses taken for a student to graduate with Honor. Note that a course can be re-taken for the purpose of satisfying this guideline.
- Both the physics AND overall GPAs of 3.0 or better are required for a student to graduate with Honor.
- All the core courses (PHYS 17200, 27200, 30600, 30700, 34400, 34000, and 42200) be complete with a B or better.
- Students need to petition to Undergraduate Committee for exceptions or requests.

Physics Website

### Summary of Program Requirements

The Summary of Program Requirements for Physics Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

Physics - BS  
PHHO  
≥120 Credits for graduation Credits

## Physics Honors Major Courses (62- 70 credits)

### Required Major Courses (47 - 54 credits)

- PHYS 17200 - Modern Mechanics (also satisfies Science Selective for core and CoS teambuilding experience requirement)
- PHYS 27200 - Electric And Magnetic Interactions (also satisfies Science Selective for core)
  
- PHYS 30600 - Mathematical Methods Of Physics I (fall)  
or
- MA 36200 - Topics In Vector Calculus and
- MA 42500 - Elements Of Complex Analysis
  
- PHYS 30700 - Mathematical Methods Of Physics II (spring)  
or
- MA 35100 - Elementary Linear Algebra or
- MA 26500 - Linear Algebra  
and
- MA 36600 - Ordinary Differential Equations or
- MA 26600 - Ordinary Differential Equations
  
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics (fall)
- PHYS 41000 - Physical Mechanics I Honors (fall)
- PHYS 41100 - Physical Mechanics II Honors (spring)
- PHYS 41600 - Thermal And Statistical Physics Honors (fall)
- PHYS 42200 - Waves And Oscillations (spring)
- PHYS 43000 - Electricity And Magnetism I Honors (spring)
- PHYS 43100 - Electricity And Magnetism II Honors (fall)

- PHYS 45000 - Intermediate Laboratory
- PHYS 46000 - Quantum Mechanics I Honors (fall)
- PHYS 46100 - Quantum Mechanics II Honors (spring)
- PHYS 59300 - Independent Research

## Major Selective\* - (15-16 credits)

- PHYS/ASTR  $\geq 500$  level - Credit Hours: 3.00
- PHYS/ASTR  $\geq 500$  level - Credit Hours: 3.00
- PHYS 53600 - Electronic Techniques For Research (spring) or
- PHYS 58000 - Computational Physics (spring)
- Science/Engineering  $\geq 300$  level ( could be met by CoS statistics requirement) - Credit Hours: 3.00
- Science/Engineering  $\geq 300$  level (could be met by CoS Great Issues requirement) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (41-68 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies Science Selective for core)
- CS 15800 - C Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 17700 - Programming With Multimedia Objects LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 18000 - Problem Solving And Object-Oriented Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement)
- STAT 30100 - Elementary Statistical Methods LINK (satisfies Information Literacy Selective for core)  
or
- STAT 35000 - Introduction To Statistics (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 50300 - Statistical Methods For Biology (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 51100 - Statistical Methods (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective)
- ENGL 10600 - First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement) or
- ENGL 10800 - Accelerated First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement)

- COM 21700 - Science Writing And Presentation LINK (satisfies Oral Communication for core and CoS technical writing and presenting requirement)
- Language I Selective - LINK - Credit Hours: 0.00 - 4.00
- Language II Selective - LINK - Credit Hours: 0.00 - 4.00
- Language and Culture III Selective - LINK - (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 0.00 - 4.00
- General Education Elective I LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective II LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective III LINK (Select courses could satisfy Humanities Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues LINK (satisfies one of the Science/Engineering requirements for Physics Selective) - Credit Hours: 3.00
- Multidisciplinary Elective LINK (Select courses could satisfy Science, Technology & Society Selective for core) - Credit Hours: 0.00 - 3.00

## Electives ( $\leq 24$ credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

### Fall 1st Year

- PHYS 17200 - Modern Mechanics (HONORS) \*
- MA 16100 - Plane Analytic Geometry And Calculus I \*
- CHM 11500 - General Chemistry \*
- ENGL 10600 - First-Year Composition \*

### 17 Credits

### Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions (HONORS) \*
- CHM 11600 - General Chemistry \*

- MA 16200 - Plane Analytic Geometry And Calculus II \*
- LANGUAGE 101 - Credit Hours: 3.00 - 4.00

## 16-17 Credits

### Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics
- MA 26100 - Multivariate Calculus \*
- LANGUAGE 102 - Credit Hours: 3.00 - 4.00

## 15-16 Credits

### Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II
- PHYS 42200 - Waves And Oscillations
- LANGUAGE 201/culture - Credit Hours: 3.00 - 4.00
- STAT 30100 - Elementary Statistical Methods \*
- Science/Engineering Selective  $\geq 300$  - Credit Hours: 3.00

## 15-16 Credits

### Fall 3rd Year

- PHYS 41000 - Physical Mechanics I Honors
- PHYS 46000 - Quantum Mechanics I Honors
- PHYS 45000 - Intermediate Laboratory
- COM 21700 - Science Writing And Presentation \*
- General Ed (Humanities) - Credit Hours: 3.00 \*
- Elective - Credit Hours: 1.00

## 15 Credits

### Spring 3rd Year

- PHYS 41100 - Physical Mechanics II Honors

- PHYS 46100 - Quantum Mechanics II Honors
- PHYS 43000 - Electricity And Magnetism I Honors
- General Ed (Humanities) - Credit Hours: 3.00 \*
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects
- Elective - Credit Hours: 1.00

## 15-16 Credits

### Fall 4th Year

- PHYS 41600 - Thermal And Statistical Physics Honors
- PHYS 43100 - Electricity And Magnetism II Honors
- PHYS 59300 - Independent Research
- Science/Engineering Selective $\geq$ 300 - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00

## 15 Credits

### Spring 4th Year

- PHYS 53600 - Electronic Techniques For Research or
- PHYS 58000 - Computational Physics
- PHYS/ASTR Selective  $\geq$ 500 - Credit Hours: 3.00
- PHYS/ASTR Selective  $\geq$ 500 - Credit Hours: 3.00
- General Ed (Behav./Social Science) - Credit Hours: 3.00 \*
- Multidisciplinary (STS) - Credit Hours: 2.00 \*
- Elective - Credit Hours: 1.00

## 15-16 Credits

### Note

\*Satisfies a University Core Requirement

120 semester credits required for Bachelor of Science degree.

3.0 Graduation GPA required for Bachelor of Science degree.

3.0 average in PHYS/ASTR classes required to graduate.

No more than one C grade (i.e., C+, C, or C-) is allowed in all physics courses taken

No grade of D+ or worse is allowed in any course.

## 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.

## Physics, BS

## About the Program

Purdue physics is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors average 30 or fewer students and are taught by professors actively engaged in forefront research. Undergraduate research is strongly encouraged and opportunities exist as early as the second semester to work in a research group. These groups include experimental and theoretical condensed matter physics, high energy physics, nano-physics, nuclear physics, astrophysics, biological physics, geophysics, relativity, and interdisciplinary areas of material science, engineering, or computational science.

The department also helps undergraduates with external internships, particularly for the summers. Upon graduation our students are accepted for graduate programs at many of the top universities and are also sought after for positions in industry, particularly high-tech positions. Our graduates have an exceptional record of career accomplishment in a wide variety of settings, including academia and major industrial and government labs.

This program offers a specialization in physics as the core of a broad general education. The core courses provide a solid foundation in Classical Mechanics, Electricity and Magnetism, Waves and Oscillations, Quantum Mechanics, Thermal and Statistical Physics, Modern Physics, Relativity, Electronics, and Computational Physics.

By using free electives in the program, a student can include concentrations in condensed matter physics (PHYS 54500), nuclear physics (PHYS 55600), astrophysics (PHYS 56000), particle physics (PHYS 56400), and other areas. Students also are encouraged to participate in one or two semesters of individual research projects with a selected faculty member (PHYS 39000, 49000, or 59000).

Opportunities for employment in fields related to physics will also be enhanced by taking free-electives in additional science courses such as biological sciences, chemistry, computer science, geosciences, meteorology, and in various branches of

engineering. With assistance from an advisor, a student can prepare an individualized program suited to career plans by selecting electives from these areas or from any other area within the University. Normally, students take such electives as juniors and seniors.

Physics Website

### **Summary of Program Requirements**

The Summary of Program Requirements for Physics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### **Detailed Program Requirements**

Please see below for detailed program requirements and possible selective fulfillments.

Physics - BS  
PHYS  
120 Credits for graduation Credits

## **Physics Major Courses (49-57 credits)**

### **Required Major Courses (37 - 44 credits)**

- PHYS 17200 - Modern Mechanics (also satisfies Science Selective for core and CoS teambuilding experience requirement)
- PHYS 27200 - Electric And Magnetic Interactions (also satisfies Science Selective for core)
  
- PHYS 30600 - Mathematical Methods Of Physics I (fall)  
or
- MA 36200 - Topics In Vector Calculus and
- MA 42500 - Elements Of Complex Analysis
  
- PHYS 30700 - Mathematical Methods Of Physics II (spring)  
or
- MA 35100 - Elementary Linear Algebra or
- MA 26500 - Linear Algebra  
and
- MA 36600 - Ordinary Differential Equations or
- MA 26600 - Ordinary Differential Equations
  
- PHYS 31000 - Intermediate Mechanics (fall)
- PHYS 33000 - Intermediate Electricity And Magnetism (fall)
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics (fall)
- PHYS 36000 - Quantum Mechanics (spring)
- PHYS 42200 - Waves And Oscillations (spring)
- PHYS 45000 - Intermediate Laboratory
- PHYS 51500 - Thermal And Statistical Physics (spring)

## Major Selective\* - (12-13 credits)

- PHYS/ASTR  $\geq 300$  level - Credit Hours: 3.00
- PHYS 53600 - Electronic Techniques For Research (spring) or
- PHYS 58000 - Computational Physics (spring)
- Science/Engineering  $\geq 300$  level (could be met by CoS statistics requirement) - Credit Hours: 3.00
- Science/Engineering  $\geq 300$  level (could be met by CoS Great Issues requirement) - Credit Hours: 3.00

## Other Departmental /Program Course Requirements (41-68 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core) or
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for core)
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning Selective for core)
- MA 26100 - Multivariate Calculus (satisfies Quantitative Reasoning Selective for core)
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies Science Selective for core)
- CS 15800 - C Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 17700 - Programming With Multimedia Objects LINK (satisfies CoS Computing and Teambuilding Experience Requirement) or
- CS 18000 - Problem Solving And Object-Oriented Programming LINK (satisfies CoS Computing and Teambuilding Experience Requirement)
- STAT 30100 - Elementary Statistical Methods LINK (satisfies Information Literacy Selective for core) or
- STAT 35000 - Introduction To Statistics (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 50300 - Statistical Methods For Biology (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective) or
- STAT 51100 - Statistical Methods (satisfies CoS statistics requirement) (satisfies one of the Science/Engineering requirements for Physics Selective)
- ENGL 10600 - First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement) or
- ENGL 10800 - Accelerated First-Year Composition LINK (satisfies Written Communication & Information Literacy for core and CoS composition requirement)
- COM 21700 - Science Writing And Presentation LINK (satisfies Oral Communication for core and CoS technical writing and presenting requirement)
- Language I Selective - LINK - Credit Hours: 0.00 - 4.00
- Language II Selective - LINK - Credit Hours: 0.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 0.00 - 4.00
- General Education Elective I - LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00
- General Education Elective II - LINK (Select courses could satisfy Human Cultures Humanities for core) - Credit Hours: 3.00



- General Education Elective III - LINK (Select courses could satisfy Humanities Behavioral/Social Science for core) - Credit Hours: 3.00
- Great Issues LINK (satisfies one of the Science/Engineering requirements for Physics Selective) - Credit Hours: 3.00
- Multidisciplinary Elective LINK (Select courses could satisfy Science, Technology & Society Selective for core) - Credit Hours: 0.00 - 3.00

## Electives ( $\leq 36$ credits)

## University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

### Fall 1st Year

- PHYS 17200 - Modern Mechanics (HONORS) \*
- MA 16100 - Plane Analytic Geometry And Calculus I \*
- CHM 11500 - General Chemistry \*
- ENGL 10600 - First-Year Composition \*

17 Credits

### Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions (HONORS) \*
- CHM 11600 - General Chemistry \*
- MA 16200 - Plane Analytic Geometry And Calculus II \*
- LANGUAGE 101 - Credit Hours: 3.00 - 4.00

16-17 Credits

## Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I
- PHYS 34000 - Modern Physics Laboratory
- PHYS 34400 - Modern Physics
- MA 26100 - Multivariate Calculus \*
- LANGUAGE 102 - Credit Hours: 3.00 - 4.00

## 15-16 Credits

## Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II
- PHYS 42200 - Waves And Oscillations
- LANGUAGE 201/culture - Credit Hours: 3.00 - 4.00
- STAT 30100 - Elementary Statistical Methods \*
  
- PHYS 23500 - Seminar In Careers In Physics or
- Elective - Credit Hours: 1.00

## 13-14 Credits

## Fall 3rd Year

- PHYS 31000 - Intermediate Mechanics
- PHYS 33000 - Intermediate Electricity And Magnetism
- PHYS 45000 - Intermediate Laboratory
- COM 21700 - Science Writing And Presentation \*
- General Ed (Humanities) - Credit Hours: 3.00 \*

## 15 Credits

## Spring 3rd Year

- PHYS 36000 - Quantum Mechanics
- PHYS 51500 - Thermal And Statistical Physics
  
- CS 15800 - C Programming or
- CS 17700 - Programming With Multimedia Objects
  
- General Ed (Humanities) - Credit Hours: 3.00 \*

- Electives - Credit Hours: 3.00

## 15-16 Credits

### Fall 4th Year

- PHYS/ASTR  $\geq 300$  level - Credit Hours: 3.00
- Great Issues - Credit Hours: 3.00
- General Ed (Behav./Social Science ) - Credit Hours: 3.00 \*
- Science/Engineering Selective $\geq 300$  - Credit Hours: 3.00
- Electives - Credit Hours: 3.00

## 15 Credits

### Spring 4th Year

- PHYS 53600 - Electronic Techniques For Research or
- PHYS 58000 - Computational Physics
  
- Multidisciplinary (STS) - Credit Hours: 1.00 - 3.00 \*
- Science/Engineering Selective $\geq 300$  - Credit Hours: 3.00
- Electives - Credit Hours: 3.00
- Electives - Credit Hours: 4.00

## 14-17 Credits

### Note

\* Satisfies a University Core Requirement

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 average in PHYS/ASTR classes required to graduate.

## 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.

## Minor

### Astronomy Minor

The following courses describe the minimum coursework necessary to earn a minor in astronomy. In addition, GPA over all PHYS and ASTR courses must be 2.0 or higher. (These requirements apply to students who matriculate at Purdue in or after Fall 2011.)

ALL REQUIRED COURSES FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY

### Minor Prerequisites

To complete the required courses listed below, the following prerequisite courses must be completed.

- PHYS 15200 - Mechanics or
- PHYS 17200 - Modern Mechanics
  
- PHYS 24100 - Electricity And Optics or
- PHYS 26100 - Electricity And Optics or
- PHYS 27200 - Electric And Magnetic Interactions

### Requirements for the Minor

To obtain a minor in Astronomy, the following courses must be completed.

- PHYS 34200 - Modern Physics or
- PHYS 34400 - Modern Physics
  
- ASTR 36300 - The Solar System and
- ASTR 36400 - Stars And Galaxies and
- ASTR 37000 - Cosmology

And Choose 3 additional credit hours from the following courses

- PHYS 56000 - Stellar Evolution or
- ASTR 56000 - Stellar Evolution or

- PHYS 56100 - Galaxies And Large Scale Structure or
- ASTR 56100 - Galaxies And Large Scale Structure or
- PHYS 56200 - Introduction To High Energy Astrophysics or
- ASTR 56200 - Introduction To High Energy Astrophysics or
- PHYS 56300 - Astroparticle Physics or
- ASTR 56300 - Astroparticle Physics or
- PHYS/ASTR - Approved PHYS/ASTR at or above 400 level - Credit Hours: 3.00

## Physics Minor

The following courses describe the minimum coursework necessary to earn a minor in Physics. In addition, GPA over all PHYS and ASTR courses must be 2.0 or higher. (These requirements apply to students who matriculate at Purdue in or after Fall 2011.)

ALL REQUIRED COURSES FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY

### Minor Prerequisites

To complete the required courses listed below, the following prerequisite courses must be completed.

- MA 16100 - Plane Analytic Geometry And Calculus I and
- MA 16200 - Plane Analytic Geometry And Calculus II
- or
- MA 16500 - Analytic Geometry And Calculus I and
- MA 16600 - Analytic Geometry And Calculus II
  
- PHYS 15200 - Mechanics and
- PHYS 24200 - Introduction To Heat And Thermal Physics
- or
- PHYS 17200 - Modern Mechanics
  
- PHYS 24100 - Electricity And Optics and
- PHYS 25200 - Electricity And Optics Laboratory
- or
- PHYS 27200 - Electric And Magnetic Interactions

### Requirements for the Minor

To obtain a minor in Physics, the following courses must be completed.

- PHYS 34200 - Modern Physics or
- PHYS 34400 - Modern Physics
  
- PHYS 34000 - Modern Physics Laboratory

Choose 6 additional credit hours at or above 300 level in Physics (PHYS)

# Department of Statistics

## Overview

The Department of Statistics is housed in Haas Hall and the Mathematical Sciences Building. The main office, the graduate office, and some of the department's faculty, staff, and student offices are located on the first and second floors of HAAS. The rest of the faculty, staff, and graduate students are located on the fifth, second, and ground floors of the MATH building. The Department's Graduate program is ranked in the top 10 by U.S. News and World Report, April 2008.

There are 37 tenured and tenure-track professors, 2 emeriti faculty, 4 adjunct faculty members, 7 visiting professors and 15 lecturers who form the Department of Statistics faculty. Visiting Scholars from all over the world enrich the group.

The Department of Statistics has about 348 undergraduate students majoring in statistics and/or actuarial science (a joint major with the Department of Mathematics).

The Department of Statistics has 104 graduate students, 71 are Ph.D. Students and 33 are M.S. students.

## Faculty

<http://www.stat.purdue.edu/people/faculty/index.php>

## Contact Information

### Department of Statistics

Purdue University  
250 N. University Street  
West Lafayette, IN 47907-2066  
USA

Phone: 1-765-494-6030

Fax: 1-765-494-0558

### Administrative Contacts

**Department Head:** Rebecca W. Doerge [doerge@purdue.edu](mailto:doerge@purdue.edu)

**Associate Head:** Hao Zhang [zhanghao@purdue.edu](mailto:zhanghao@purdue.edu)

**Assistant to the Head:** Diane Martin [martindl@purdue.edu](mailto:martindl@purdue.edu)

## Graduate Information

For Graduate Information please see [Statistics Graduate Program Information](#).

## Baccalaureate

## Applied Statistics, BS

# About the Program

Statistics at Purdue University is one of the largest (students and faculty) in the United States. It is consistently rated by U.S. News and World Report as one of the top departments in the country. It offers courses in fundamental statistics and probability, and also courses that focus on statistical computation to train students as future data scientists. Students enjoy a great deal of interaction with faculty as well as small classes. The department offers a master's program in which a student can earn both a bachelor's degree and a master's degree in five years.

The statistics major consists of two options:

- Applied statistics
  - Mathematical statistics (Mathematical statistics usually leads to a double major in mathematics and statistics.)
- Statistics - Applied Statistics Website

## Summary of Program Requirements

The Summary of Program Requirements for Applied Statistics is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

## Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

STAT-BS  
Code-STAP

## Departmental/Program Major Courses (69-93 credits)

### Required Major Courses (36-40 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics (satisfies Statistics Requirement)
  
- MA 36200 - Topics In Vector Calculus or
- STAT 42000 - Introduction To Time Series
  
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦ or
- STAT 51600 - Basic Probability And Applications ♦
  
- STAT 41700 - Statistical Theory or
- STAT 51700 - Statistical Inference
  
- STAT 51200 - Applied Regression Analysis

## Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16500 - Analytic Geometry And Calculus I

## Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

## Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus ♦
- MA 17400 - Multivariable Calculus ♦
- MA 18200 - Honors Calculus II ♦
- MA 27100 - Several Variable Calculus ♦

## Applied STAT Selective (6-7 credits)

- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments or
- STAT 42000 - Introduction To Time Series or
- STAT 47201 - Actuarial Models- Life Contingencies or
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives or
- STAT 50600 - Statistical Programming And Data Management or
- STAT 52200 - Sampling And Survey Techniques

## Other Departmental /Program Course Requirements (33-53 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
  
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00



- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfy Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (27-51 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

## Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 2.00
- Free Elective - Credit Hours: 3.00

## 15-18 Credits

## Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

## 15-18 Credits

## Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00 ♦
- General Education Selective - Credit Hours: 3.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 5.00

## 15-17 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 6.00

## 15 Credits

## Fall 3rd Year

- MA 36200 - Topics In Vector Calculus or
- STAT 42000 - Introduction To Time Series
  
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
  
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Spring 3rd Year

- STAT 41700 - Statistical Theory
- Applied STAT Selective - Credit Hours: 3.00 - 4.00
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 6.00

## 15-17 Credits

### Fall 4th Year

- STAT 51200 - Applied Regression Analysis
- General Education Selective I - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- Free Elective - Credit Hours: 9.00

## 15-18 Credits

### Spring 4th Year

- Applied STAT Selective - Credit Hours: 3.00
- General Education Selective II - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 6.00

## 15 Credits

### Note

Student should earn minimum of a C.

Students must earn a 2.0 average in MATH/STAT courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

## Statistics - Math Emphasis, BS

### About the Program

Statistics at Purdue University is one of the largest (students and faculty) in the United States. It is consistently rated by *U.S. News and World Report* as one of the top departments in the country. It offers courses in fundamental statistics and probability, and also courses that focus on statistical computation to train students as future data scientists. Students enjoy a great deal of interaction with faculty as well as small classes. The department offers a master's program in which a student can earn both a bachelor's degree and a master's degree in five years.

The statistics major consists of two options:

- Applied statistics
- Mathematical statistics (Mathematical statistics usually leads to a double major in mathematics and statistics.)

Statistics - Applied Statistics Website

#### Summary of Program Requirements

The Summary of Program Requirements for Statistics-Math Emphasis is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

#### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

STAT-BS  
Code-STMA

### Departmental/Program Major Courses (65-99 credits)

## Required Major Courses (42-46 credits)

Average GPA in courses must be 2.00

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics (satisfies Statistics Requirement)
  
- MA 34100 - Foundations Of Analysis or
- MA 44000 - Real Analysis Honors
  
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦ or
- STAT 51600 - Basic Probability And Applications ♦
  
- STAT 41700 - Statistical Theory or
- STAT 51700 - Statistical Inference
  
- STAT 51200 - Applied Regression Analysis
- MA 35300 - Linear Algebra II With Applications

## Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16500 - Analytic Geometry And Calculus I

## Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

## Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus ♦
- MA 17400 - Multivariable Calculus ♦
- MA 18200 - Honors Calculus II ♦
- MA 27100 - Several Variable Calculus ♦

## Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

### Advanced MA Selective (3-4 credits)

- MA 36600 - Ordinary Differential Equations or
- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 42500 - Elements Of Complex Analysis or
- MA 42800 - Introduction To Fourier Analysis or
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors or
- MA 52000 - Boundary Value Problems Of Differential Equations

### STAT Selective (3 credits)

- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments or
- STAT 42000 - Introduction To Time Series or
- IE 53000 - Quality Control

### Other Departmental /Program Course Requirements (33-53 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
  
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
- Technical Writing Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (21-45 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00
- ENGL 10600 - First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 3.00 - 4.00

### 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

### 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00 ♦
- General Education Selective - Credit Hours: 3.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

## 15-17 Credits

### Spring 2nd Year

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 6.00

## 15 Credits

### Fall 3rd Year

- MA 34100 - Foundations Of Analysis
- MA 41600 - Probability ♦ or
- STAT 41600 - Probability ♦
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15-16 Credits

### Spring 3rd Year

- Advance Calculus Selective - Credit Hours: 3.00
- STAT 41700 - Statistical Theory
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 6.00

## 15-16 Credits

### Fall 4th Year



- Advanced MA Selective - Credit Hours: 3.00
- STAT 51200 - Applied Regression Analysis
- General Education Selective I - Credit Hours: 3.00
- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-18 Credits

### Spring 4th Year

- MA 35300 - Linear Algebra II With Applications
- STAT Selective - Credit Hours: 3.00
- General Education Selective II - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

## 15 Credits

### Note

Student should earn minimum of a C.

Students must earn a 2.0 average in MATH/STAT/IE courses required for major.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

# Statistics Honors, BS

## About the Program

Statistics at Purdue University is the only doctorate-granting program in statistics in Indiana and is one of the largest (students and faculty) in the United States. It is consistently rated by *U.S. News and World Report* as one of the top departments in the country. Students enjoy a great deal of interaction with faculty as well as small classes. For students with excellent preparation in high school, the department offers a master's program in which a student can earn both a bachelor's degree and a master's degree in five years.

The statistics major consists of two options:

- Applied statistics
- Mathematical statistics (Mathematical statistics usually leads to a double major in mathematics and statistics.)

Statistics - Applied Statistics Website

### Summary of Program Requirements

The Summary of Program Requirements for Statistics Honors is a comprehensive list of those categories which a student must fulfill in order to earn their degree. Unlike the full Detailed Program Requirements listed below, complete lists of selectives for any given category are not shown. These summaries are intended to be printer-friendly and less expansive in detail.

### Detailed Program Requirements

Please see below for detailed program requirements and possible selective fulfillments.

STAT-BS  
Code-STHO

## Departmental/Program Major Courses (75-99 credits)

### Required Major Courses (42-46 credits)

Average GPA in courses must be 2.00 AND Average GPA in MA 44000, MA 44200, MA 45000, STAT 51600, or STAT 41700 must be 3.5 or higher - must take three of these five courses\*.

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics (satisfies Statistics Requirement)
  
- MA 34100 - Foundations Of Analysis \* or
- MA 44000 - Real Analysis Honors \*
  
- MA 41600 - Probability \* ♦ or
- STAT 41600 - Probability \* ♦ or
- STAT 51600 - Basic Probability And Applications \* ♦
  
- STAT 41700 - Statistical Theory \* or

- STAT 51700 - Statistical Inference \*
- STAT 51200 - Applied Regression Analysis
- MA 35300 - Linear Algebra II With Applications

### Calculus I Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16500 - Analytic Geometry And Calculus I

### Calculus II Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 16200 - Plane Analytic Geometry And Calculus II
- MA 16600 - Analytic Geometry And Calculus II
- MA 17300 - Calculus And Analytic Geometry II
- MA 18100 - Honors Calculus I

### Calculus III Selective - Select from (4-5 credits)

(satisfies Quantitative Reasoning for core)

- MA 26100 - Multivariate Calculus ♦
- MA 17400 - Multivariable Calculus ♦
- MA 18200 - Honors Calculus II ♦
- MA 27100 - Several Variable Calculus ♦

### Advance Calculus Selective (3 credits)

- MA 36200 - Topics In Vector Calculus or
- MA 44200 - Multivariate Analysis I Honors or
- MA 51000 - Vector Calculus

### Advanced MA Selective (3-4 credits)

- MA 36600 - Ordinary Differential Equations or
- MA 37500 - Introduction To Discrete Mathematics or
- MA 42100 - Linear Programming And Optimization Techniques or
- MA 42500 - Elements Of Complex Analysis or
- MA 42800 - Introduction To Fourier Analysis or
- MA 45300 - Elements Of Algebra I or
- MA 45000 - Algebra Honors \* or

- MA 52000 - Boundary Value Problems Of Differential Equations

## STAT Selective (3 credits)

- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments or
- STAT 42000 - Introduction To Time Series or
- IE 53000 - Quality Control

## Other Departmental /Program Course Requirements (33-53 credits)

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy for core)
  
- Language I Selective - LINK - Credit Hours: 3.00 - 4.00
- Language II Selective - LINK - Credit Hours: 3.00 - 4.00
- Language and Culture III Selective - LINK (Select courses COULD satisfy Human Cultures Humanities for core) - Credit Hours: 3.00 - 4.00
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- Technical Presenting Selective LINK (Select courses COULD satisfy Oral Communication for core) - Credit Hours: 0.00 - 3.00
- Laboratory Science I Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- Laboratory Science II Selective LINK (satisfies Science Selective for core) - Credit Hours: 3.00 - 4.00
- General Education Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education I Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- General Education II Selective LINK (Select courses COULD satisfy Human Culture Behavioral/Social Science for core) - Credit Hours: 3.00
- Computing Selective LINK - Credit Hours: 3.00 - 4.00
- Teambuilding Experience LINK - Credit Hours: 0.00 - 3.00
- Multidisciplinary Experience LINK (Select courses COULD satisfies Science, Technology, and Society Selective for core) - Credit Hours: 0.00 - 4.00
- Great Issues Selective LINK - Credit Hours: 3.00

## Electives (21-45 credits)

## University Core Requirements

LINK

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2

- Science, Technology & Society Selective
- Written Communication
- Oral Communication
- Quantitative Reasoning

## Program Requirements

[http://www.science.purdue.edu/Current\\_Students/majors/index.html](http://www.science.purdue.edu/Current_Students/majors/index.html)

### Fall 1st Year

- Calculus I Selective - Credit Hours: 4.00 - 5.00
- ENGL 10600 - First-Year Composition or
- ENGL 10800 - Accelerated First-Year Composition
- Language I Selective - Credit Hours: 3.00 - 4.00
- Free Elective MA 10800 - Mathematics As A Profession And A Discipline
- Free Elective - Credit Hours: 4.00

### 15-18 Credits

### Spring 1st Year

- Calculus II Selective - Credit Hours: 4.00 - 5.00
- Computing Selective - Credit Hours: 3.00 - 4.00
- Language II Selective - Credit Hours: 3.00 - 4.00
- Teambuilding Experience - Credit Hours: 0.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 2.00

### 15-18 Credits

### Fall 2nd Year

- Calculus III Selective - Credit Hours: 4.00 - 5.00 ♦
- General Education Selective - Credit Hours: 3.00
- Language Selective III - Credit Hours: 3.00 - 4.00
- Free Elective MA 30100 - An Introduction To Proof Through Real Analysis
- Free Elective - Credit Hours: 2.00

### 15-17 Credits

## Spring 2nd Year

- MA 35100 - Elementary Linear Algebra
- STAT 35000 - Introduction To Statistics
- COM 21700 - Science Writing And Presentation
- Free Elective - Credit Hours: 6.00

15 Credits

## Fall 3rd Year

- MA 34100 - Foundations Of Analysis \* or
- MA 44000 - Real Analysis Honors \*
  
- MA 41600 - Probability \* ♦ or
- STAT 41600 - Probability \* ♦ or
- STAT 51600 - Basic Probability And Applications \* ♦
  
- Laboratory Science Selective I - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

15-16 Credits

## Spring 3rd Year

- Advance Calculus Selective - MA 44200 - Multivariate Analysis I Honors \*
  
- STAT 41700 - Statistical Theory \* or
- STAT 51700 - Statistical Inference \*
  
- Laboratory Science Selective II - Credit Hours: 3.00 - 4.00
- Free Elective - Credit Hours: 6.00

15-16 Credits

## Fall 4th Year

- MA 35300 - Linear Algebra II With Applications
- STAT 51200 - Applied Regression Analysis
- General Education Selective I - Credit Hours: 3.00

- Multidisciplinary Experience - Credit Hours: 0.00 - 4.00
- Free Elective - Credit Hours: 3.00 - 6.00

## 15-18 Credits

### Spring 4th Year

- Advanced MA Selective - MA 45000 - Algebra Honors \*
- STAT Selective - Credit Hours: 3.00
- General Education Selective II - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00
- Great Issues Selective - Credit Hours: 3.00

## 15-16 Credits

### Note

Student should earn minimum of a C.

Students must earn a 2.0 average in MATH/STAT/IE courses required for major AND Average GPA in MA 44000, MA 44200, MA 45000, STAT 51600, or STAT 41700 must be 3.5 or higher - must take three of these five courses\*.

120 semester credits required for Bachelor of Science degree.

2.0 Graduation GPA required for Bachelor of Science degree.

## 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.

# Minor

## Statistics Minor

The following courses describe the minimum coursework necessary to earn a minor in Statistics.

ALL COURSES FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY

Students Majoring in Actuarial Science, Applied Statistics, Mathematical Statistics, and/or Statistics with Math cannot complete this minor.

## Pre-requisite Courses for Stat Minor

To complete the required courses for the Statistics minor, you will need to first complete the following pre-requisite courses [by completing the course or establishing credit]. These courses are not part of the Statistics minor.

- MA 16500 - Analytic Geometry And Calculus I
- MA 16100 - Plane Analytic Geometry And Calculus I
- MA 16010 - Applied Calculus I [Note: students only completing MA 16010 will have limited pathways to finish the minor due to pre-requisites]

## Minor Requirements

To obtain a minor in Statistics, the following courses must be completed. A course can only be used in one area.

3 credits from AREA 1, 3 credits from AREA 2, 3 credits from AREA 3, 6 credits from AREA 4 = 15 TOTAL Credits

### Area 1

CHOOSE ONE COURSE

- STAT 35000 - Introduction To Statistics
- STAT 50300 - Statistical Methods For Biology
- STAT 51100 - Statistical Methods
- MGMT 30500 - Business Statistics MANAGEMENT STUDENTS ONLY!
- IE 33000 - Probability And Statistics In Engineering II IE STUDENTS ONLY!\*

### Area 2

CHOOSE ONE COURSE

- STAT 22500 - Introduction To Probability Models
- STAT 31100 - Introductory Probability
- STAT 41600 - Probability
- IE 23000 - Probability And Statistics In Engineering I IE STUDENTS ONLY!\*



## Area 3

- STAT 51200 - Applied Regression Analysis

## Area 4

CHOOSE TWO COURSES

- STAT 51300 - Statistical Quality Control or
- IE 53000 - Quality Control
  
- STAT 51400 - Design Of Experiments
- STAT 41600 - Probability
- STAT 41700 - Statistical Theory
- IE 33600 - Operations Research - Stochastic Models

## Note

AT LEAST 9 credits of the 15 credit hour minor must be STAT courses.

IE 53000 is considered a STAT course due to cross-listing

**Due to Minor Requirements and Pre-requisites, Below are the Suggested Pathways for Specific Majors**

## Krannert Students

- STAT 22500 - Introduction To Probability Models
- MGMT 30500 - Business Statistics
- STAT 51200 - Applied Regression Analysis
- STAT 51300 - Statistical Quality Control
- STAT 51400 - Design Of Experiments

## IE Majors

- IE 23000 - Probability And Statistics In Engineering I
- IE 33000 - Probability And Statistics In Engineering II
- STAT 51200 - Applied Regression Analysis
  
- STAT 51300 - Statistical Quality Control or
- IE 53000 - Quality Control
  
- STAT 51400 - Design Of Experiments

## Pharmacy, Nursing, Biology, Agriculture Majors

- STAT 50300 - Statistical Methods For Biology
- STAT 22500 - Introduction To Probability Models
- STAT 51200 - Applied Regression Analysis
- STAT 51300 - Statistical Quality Control
- STAT 51400 - Design Of Experiments

## MATH Majors

- STAT 35000 - Introduction To Statistics
- STAT 41600 - Probability
- STAT 51200 - Applied Regression Analysis
- STAT 41700 - Statistical Theory
- STAT 51400 - Design Of Experiments

## Science

- STAT 51100 - Statistical Methods
- STAT 22500 - Introduction To Probability Models
- STAT 51200 - Applied Regression Analysis
- STAT 51300 - Statistical Quality Control
- STAT 51400 - Design Of Experiments

## Note

Courses that do not require calculus, such as PSY 20100 and SOC 38200, are not equivalent to the courses listed.