College of Science

Overview

Purdue University's College of Science is committed to the persistent pursuit of the mathematical and scientific knowledge that forms the very foundation of innovation. Nearly 350 tenure-track faculty conduct world-changing research and deliver a transformative education to more than 6,000 undergraduates and 1,750 graduate students. We develop practical solutions to today's toughest challenges with degree programs in the life sciences, physical sciences, computational sciences, mathematics, and data science.

Undergraduate Degree

Program Information for Undergraduate: College of Science (Undergraduate)

Graduate Degree

Purdue University College of Science graduate students achieve excellence through groundbreaking research, teaching and scholastics. Often working side-by-side with their professors, these students experience cutting-edge work in their respective fields and the results of this work are newsworthy.

Program Information for Graduate: College of Science (Graduate)

Website: College of Science - Purdue University
College of Science (Undergraduate)

College of Science

The College of Science encompasses the physical, life, computational, and mathematics sciences, offering 41 disciplinary degree programs and seven interdisciplinary science programs. The leadership of our renowned scholars and researchers drives an ever-expanding culture of discovery and innovation which embraces all perspectives as we endeavor to solve the grand challenges that face our world. Nearly 350 tenure-track faculty conduct world-changing research and deliver a transformative education to more than 1750 graduate students and 6000 undergraduates. We are a community of learners that develops practical solutions to today's toughest challenges.

By extension, College of Science students are innovation leaders whose disciplinary technical expertise and exemplary problem-solving skills are in high demand. Industry, professional schools, and graduate programs equally value our students for their professional skills and ability to drive discovery in a highly diverse global environment collaboratively. Each undergraduate program blends courses and experiences that create a unique path for each student as they pursue disciplinary interests and personal and professional goals through minors, certificates, and experiential learning opportunities, including research and Study Abroad programs. For example, the Learning Beyond the Classroom certificate, open only to science students, blends career and professional; service, citizenship, and leadership; and domestic and international diversity experiences to bring real-world know-how to the classroom experience.

Departmental Pages

- Science Administration
- Biological Sciences
- Chemistry
- Computer Science
- Earth, Atmospheric and Planetary Sciences
- Mathematics
- Physics and Astronomy
- Statistics

Admissions

More Information
Teacher Education Program (TEP) Requirements and Milestones

Advising

More Information

College of Science
Policy Information

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

Academic 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 Core Requirements

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Multidisciplinary Experience
- Statistics
- Teambuilding and Collaboration
College of Science Administration

About the Department of Science Administration

During their Purdue career, students take advantage of the many benefits of the College of Science. From Nobel Prize-winning faculty to undergraduate research opportunities and study abroad opportunities to facilities found in the international spotlight, the College of Science offers a springboard to academic and career aspirations.

Faculty

Contact Information

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- 765-494-4488

<table>
<thead>
<tr>
<th>Contact Individual College of Science Group</th>
<th>General Email Address</th>
<th>Contact Person</th>
<th>Contact's Email</th>
</tr>
</thead>
<tbody>
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<td>Dean's Office - Speech/Appearance Request</td>
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Bachelor of Science

Interdisciplinary Science, BS (Biology)

About the Interdisciplinary Science 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.

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.
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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.
Degree Requirements

120 Credits Required

Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)

Required Biology Courses (7-8 credits)

Choose one option below. Select courses COULD satisfy Science for Core.

Option I
- BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
- BIOL 11100 - Fundamentals Of Biology II Credits: 4.00

Option II
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00

Required Chemistry Courses (4-10 credits)

Choose one option below. Select courses COULD satisfy Science for Core.

Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.

Option I
- CHM 11500 - General Chemistry Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00

Option II
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

Option III
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Option IV
- CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)
Choose one option below: EAPS students must choose Option III.

**Option I** - for Non-EAPS Concentrations
- EAPS 10000 - Planet Earth **Credits:** 3.00

**Option II** - Students who are interested in Geology courses.
- EAPS 10900 - The Dynamic Earth **Credits:** 3.00

**Option III** - Students who are interested in Environmental, Geology, and Planetary Sciences courses
- EAPS 11100 - Physical Geology **Credits:** 3.00

**Option IV** - Students who are interested in Atmospheric Science courses.
- EAPS 22100 - Survey Of Atmospheric Science **Credits:** 3.00
- EAPS 23000 - Laboratory In Atmospheric Science **Credits:** 2.00

**Option V** - Students who are interested in Atmospheric Science courses.
- EAPS 22500 - Science Of The Atmosphere **Credits:** 3.00
- EAPS 23000 - Laboratory In Atmospheric Science

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**Required Mathematics Courses (6-10 credits)**

Choose one option below: only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

**Option I**
- MA 16010 - Applied Calculus I **Credits:** 3.00
- MA 16020 - Applied Calculus II **Credits:** 3.00

**Option II** - Take one Calculus I and one Calculus II.
- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 or
- MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00

**Required Physics Courses (8 credits)**

Choose one option below: Physics students must choose Option III or Option IV.

**Option I**
- PHYS 23300 - Physics For Life Sciences I **Credits:** 4.00
- PHYS 23400 - Physics For Life Sciences II **Credits:** 4.00

**Option II**
- PHYS 22000 - General Physics **Credits:** 4.00
- PHYS 22100 - General Physics **Credits:** 4.00

**Option III**
- PHYS 17200 - Modern Mechanics **Credits:** 4.00
- PHYS 27200 - Electric And Magnetic Interactions **Credits:** 4.00

**Option IV**
- PHYS 17200 - Modern Mechanics
- PHYS 24100 - Electricity And Optics **Credits:** 3.00
- PHYS 25200 - Electricity And Optics Laboratory **Credits:** 1.00

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**Required Statistics Course (3 credits)**

Choose one course below from those noted for your area.
• STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
• STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
• STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
• STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
• STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (33-34 credits)

Required Biology Primary Area Courses (15-16 credits)

• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
  BIOLOGY SELECTIVE COURSE - Choose one option.
• BIOL 32800 - Principles Of Physiology Credits: 4.00
• BIOL 36700 - Principles Of Development Credits: 2.00
• BIOL 38700 - Macromolecules Credits: 2.00
• BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
• BIOL 41600 - Viruses And Viral Disease Credits: 3.00
• BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
• BIOL 43600 - Neurobiology Credits: 3.00
• BIOL 43800 - General Microbiology Credits: 3.00

Required Supporting Area Courses (18 credits)

MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

## Composition & Presentation

### Written Communication (3-4 credits)

Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

### Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

## Computing

*Met with required major coursework.*

## Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

## General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

## Great Issues In Science (3 credits)

Choose one from this list.

## Laboratory Science

*Met with required major coursework.*
Mathematics

*Met with required major coursework.*

Science Technology and Society\(^*\) (1-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

*Met with required major coursework.*

Team-Building and Collaboration\(^*\) (0-3 credits)

Choose one from this list.

Electives (2-38 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation
College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:
• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• BIOL 11000 - Fundamentals Of Biology I Credits: 4.00 ♦
  or
• BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ and
• BIOL 13500 - First Year Biology Laboratory Credits: 2.00 ♦
• Required Mathematics Course: Calculus I - Credit Hours: 3.00 - 5.00
• Required Chemistry Course - Credit Hours: 4.00 - 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 0.00 - 1.00

15-18 Credits

Spring 1st Year

• BIOL 11100 - Fundamentals Of Biology II Credits: 4.00 ♦ or
• BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• Required Mathematics Course: Calculus II - Credit Hours: 3.00 - 5.00
• Required Chemistry Course - Credit Hours: 4.00 - 5.00
13-18 Credits

Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Supporting Area Course - Credit Hours: 3.00
- Elective - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

17 Credits

Fall 3rd Year

- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 35500 - Statistics For Data Science Credits: 3.00 or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Spring 3rd Year
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
• COM 21700 - Science Writing And Presentation Credits: 3.00
• Required EAPS Selective Course - Credit Hours: 3.00 - 4.00
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

15-16 Credits

Fall 4th Year

• Biology Selective Course 3.00 - 4.00
• Supporting Area Course - Credit Hours: 3.00
• Great Issues In Science - Credit Hours: 3.00
• Required Physics Selective Course: I - Credit Hours: 4.00
• Elective - Credit Hours: 2.00

15-16 Credits

Spring 4th Year

• Supporting Area Course - Credit Hours: 3.00
• Required Physics Selective Course: II - Credit Hours: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 2.00

16-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

World Language Courses
World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Interdisciplinary Science, BS (Chemistry)

About the Interdisciplinary Science 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.

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Interdisciplinary Science Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

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**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

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- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
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- Teambuilding and Collaboration

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**Degree Requirements**

**120 Credits Required**

**Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)**

**Required Biology Courses (7-8 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

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• BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
• BIOL 11100 - Fundamentals Of Biology II Credits: 4.00
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• BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
• BIOL 13500 - First Year Biology Laboratory Credits: 2.00

Required Chemistry Courses (4-10 credits)

Choose one option below. Select courses COULD satisfy Science for Core.

Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.

Option I
• CHM 11500 - General Chemistry Credits: 4.00
• CHM 11600 - General Chemistry Credits: 4.00

Option II
• CHM 12500 - Introduction To Chemistry I Credits: 5.00
• CHM 12600 - Introduction To Chemistry II Credits: 5.00

Option III
• CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Option IV
• CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.

• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below: EAPS students must choose Option III.

Option I - for Non-EAPS Concentrations
• EAPS 10000 - Planet Earth Credits: 3.00

Option II - Students who are interested in Geology courses.
• EAPS 10900 - The Dynamic Earth Credits: 3.00

Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
• EAPS 11100 - Physical Geology Credits: 3.00

Option IV - Student who are interested in Atmospheric Science courses.
• EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00

Option V - Student who are interested in Atmospheric Science courses.
• EAPS 22500 - Science Of The Atmosphere Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

Option I
- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16020 - Applied Calculus II Credits: 3.00

Option II - Take one Calculus I and one Calculus II.
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)

Choose one option below; Physics students must choose Option III or Option IV.

Option I
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00

Option II
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00

Option III
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00

Option IV
- PHYS 17200 - Modern Mechanics
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Required Statistics Course (3 credits)

Choose one course below from those noted for your area.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
- STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
- STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
- STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (34-36 credits)

Required Chemistry Primary Area Courses (16-18 credits)

- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
• CHM 37200 - Physical Chemistry Credits: 4.00

Organic Chemistry Lecture I (3-4 credits)
Choose one course in Organic Chemistry I.

• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
• CHM 26100 - Organic Chemistry I Credits: 3.00
• CHM 26505 - Organic Chemistry I Credits: 3.00
• PHSC 20400 - Organic Chemistry I Credits: 3.00

Organic Chemistry Laboratory I (0-2 Credits)
Choose one Organic Chemistry Laboratory I course (students taking PHSC 20400 do not need an additional laboratory I course).

• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• CHM 26300 - Organic Chemistry Laboratory I Credits: 1.00
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00
• CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00

Organic Chemistry Lecture II (3-4 credits)
Choose one course in Organic Chemistry II.

• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
• CHM 26200 - Organic Chemistry II Credits: 3.00
• CHM 26605 - Organic Chemistry II Credits: 3.00
• PHSC 20500 - Organic Chemistry II Credits: 3.00

Organic Chemistry Laboratory II (0-2 Credits)
Choose one Organic Chemistry Laboratory II course (students taking PHSC 20500 do not need an additional laboratory I course).

• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
• CHM 26400 - Organic Chemistry Laboratory II Credits: 1.00
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00
• CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00

Required Supporting Area Courses (18 credits)
MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ Labeled as a Science Core Selection in the four year plan of study
*Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**First-Year Composition (3-4 credits)**

Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

**Technical Writing And Presentation* (0-6 credits)**

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- **International Students Only**: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one course from this list.

**Laboratory Science**

*Met with required major coursework.*
Mathematics

*Met with required major coursework.*

Science Technology and Society* (0-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

*Met with required major coursework.*

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Electives (0-37 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation
*Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

**College of Science Pass/No Pass Option Policy**

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:
• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• Calculus I Option - Credit Hours: 3.00 - 5.00
• General Chemistry Selective I - Credit Hours: 4.00 - 5.00
• Biology Selective I - Credit Hours: 4.00
• Science Core First-Year Composition - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 0.00 - 1.00

15-18 Credits

Spring 1st Year

• General Chemistry Selective II - Credit Hours: 4.00 - 5.00
• Biology Selective II - Credit Hours: 3.00 - 4.00
• Biology Selective II - Credit Hours: 0.00 - 2.00
• Calculus II Option - Credit Hours: 3.00 - 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-18 Credits

Fall 2nd Year

• Organic Chemistry I with Lab - Credit Hours: 4.00 - 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Physics Selective I - Credit Hours: 4.00
• Elective - Credit Hours: 1.00

15-17 Credits
Spring 2nd Year

- Organic Chemistry II with Lab - Credit Hours: 4.00 - 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Supporting Area Course - Credit Hours: 3.00
- Physics Selective II - Credit Hours: 4.00
- Elective - Credit Hours: 1.00

15-17 Credits

Fall 3rd Year

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 35500 - Statistics For Data Science Credits: 3.00 or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- CS 15900 - C Programming Credits: 3.00 or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- EAPS Selective Course - Credit Hours: 3.00 - 4.00
- Supporting Area Course - Credit Hours: 3.00
- Supporting Area Course - Credit Hours: 3.00

16-18 Credits

Fall 4th Year

- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Great Issues Option - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
16 Credits

Spring 4th Year

- CHM 37200 - Physical Chemistry Credits: 4.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Interdisciplinary Science, BS (Computer Science)

About the Interdisciplinary Science 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.

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.

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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements
All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)**

**Required Biology Courses (7-8 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

**Option I**
- BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
- BIOL 11100 - Fundamentals Of Biology II Credits: 4.00

**Option II**
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00

**Required Chemistry Courses (4-10 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

*Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.*

**Option I**
- CHM 11500 - General Chemistry Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00

**Option II**
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

**Option III**
Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below; EAPS students must choose Option III.

- Option I - for Non-EAPS Concentrations
  - EAPS 10000 - Planet Earth Credits: 3.00
- Option II - Students who are interested in Geology courses.
  - EAPS 10900 - The Dynamic Earth Credits: 3.00
- Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
  - EAPS 11100 - Physical Geology Credits: 3.00
- Option IV - Student who are interested in Atmospheric Science courses.
  - EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00
  - EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
- Option V - Student who are interested in Atmospheric Science courses.
  - EAPS 22500 - Science Of The Atmosphere Credits: 3.00
  - EAPS 23000 - Laboratory In Atmospheric Science

Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

- Option I
  - MA 16010 - Applied Calculus I Credits: 3.00
  - MA 16020 - Applied Calculus II Credits: 3.00
  - MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
  - MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
  - MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
  - MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)

Choose one option below; Physics students must choose Option III or Option IV.

- Option I
  - PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00  
  Option II  
• PHYS 22000 - General Physics Credits: 4.00  
• PHYS 22100 - General Physics Credits: 4.00  
  Option III  
• PHYS 17200 - Modern Mechanics Credits: 4.00  
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00  
  Option IV  
• PHYS 17200 - Modern Mechanics  
• PHYS 24100 - Electricity And Optics Credits: 3.00  
• PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Required Statistics Course (3 credits)

Choose one course below from those noted for your area.

• STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)  
• STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)  
• STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)  
• STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)  
• STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (34 credits)

Required Computer Science Primary Area Courses (16 credits)

• CS 18200 - Foundations Of Computer Science Credits: 3.00  
• CS 24000 - Programming In C Credits: 3.00  
• CS 25000 - Computer Architecture Credits: 4.00  
• CS 25100 - Data Structures And Algorithms Credits: 3.00  
• CS Elective at or above 30000 level - Credit Hours: 3.00

Required Supporting Area Courses (18 credits)

MUST BE APPROVED BY COLLEGE

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four-year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation
First-Year Composition (3-4 credits)

Choose one course from this list (satisfies Written Communication and Information Literacy for core).

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- **International Students Only**: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Sciences for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework.*

Mathematics

*Met with required major coursework.*
Science Technology and Society* (0-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

Met with required major coursework.

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Electives (2-33 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation

*Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

College of Science Pass/No Pass Option Policy
• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• EAPS Selective Course - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 2.00

15-18 Credits

Spring 1st Year

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00 - 4.00

14-16 Credits

Fall 2nd Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00
• CS 24000 - Programming In C Credits: 3.00
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00

15-16 Credits

Spring 2nd Year
• CS 25000 - Computer Architecture Credits: 4.00
• CS 25100 - Data Structures And Algorithms Credits: 3.00
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Fall 3rd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• CS Elective 30000 level - Credit Hours: 3.00
• Physics Selective I - Credit Hours: 4.00
• General Chemistry Selective I - Credit Hours: 4.00 - 5.00
• Elective - Credit Hours: 1.00

15-16 Credits

Spring 3rd Year

• Supporting Area Course - Credit Hours: 3.00
• Physics Selective II - Credit Hours: 4.00
• General Chemistry Selective - Credit Hours: 4.00 - 5.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

15-16 Credits

Fall 4th Year

• Supporting Area Course - Credit Hours: 3.00
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 0.00 - 3.00
• Biology Selective I - Credit Hours: 4.00
• Great Issues Option: 3.00
• Elective - Credit Hours: 0.00 - 2.00

15-16 Credits

Spring 4th Year

• Science Core Selection - Credit Hours: 3.00
• Supporting Area Course - Credit Hours: 3.00
- Biology Selective II - Credit Hours: 3.00 - 4.00
- Biology Selective II - Credit Hours: 2.00
- Elective - Credit Hours: 4.00

15-16 Credits

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Interdisciplinary Science, BS (Earth, Atmospheric, and Planetary Sciences)

About the Interdisciplinary Science 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.
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.

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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)

Required Biology Courses (7-8 credits)

Choose one option below. Select courses COULD satisfy Science for Core.

Option I
- BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
- BIOL 11100 - Fundamentals Of Biology II Credits: 4.00

Option II
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00

Required Chemistry Courses (4-10 credits)

Choose one option below. Select courses COULD satisfy Science for Core.

Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.

Option I
- CHM 11500 - General Chemistry Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00

Option II
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

Option III
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Option IV
- CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.

- CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below; EAPS students must choose Option III.

Option I - for Non-EAPS Concentrations
• EAPS 10000 - Planet Earth Credits: 3.00
Option II - Students who are interested in Geology courses.
• EAPS 10900 - The Dynamic Earth Credits: 3.00
Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
• EAPS 11100 - Physical Geology Credits: 3.00
Option IV - Student who are interested in Atmospheric Science courses.
• EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
Option V - Student who are interested in Atmospheric Science courses.
• EAPS 22500 - Science Of The Atmosphere Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science

Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

Option I
• MA 16010 - Applied Calculus I Credits: 3.00
• MA 16020 - Applied Calculus II Credits: 3.00
Option II - Take one Calculus I and one Calculus II.
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)

Choose one option below; Physics students must choose Option III or Option IV.

Option I
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00
Option II
• PHYS 22000 - General Physics Credits: 4.00
• PHYS 22100 - General Physics Credits: 4.00
Option III
• PHYS 17200 - Modern Mechanics Credits: 4.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
Option IV
• PHYS 17200 - Modern Mechanics
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

**Required Statistics Course (3 credits)**

*Choose one course below from those noted for your area.*

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
- STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
- STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
- STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

**Departmental/Program Major Courses: Areas (33-34 credits)**

**Required Earth, Atmospheric, and Planetary Sciences Primary Area Courses (15 - 16 credits)**

- EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00 or
- EAPS 22500 - Science Of The Atmosphere Credits: 3.00
- EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
- EAPS 11200 - Earth Through Time Credits: 3.00 - (or any EAPS course 20000 level or higher) - Credit Hours: 3.00
- EAPS 30000 level or higher - Credit Hours: 3.00
- EAPS 30000 level or higher - Credit Hours: 3.00
- EAPS 30000 level or higher - Credit Hours: 3.00

**Required Supporting Area Courses (18 credits)**

MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

**Other Departmental/Program Course Requirements (15-37 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four-year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**First-Year Composition (3-4 credits)**

Choose one course from this list (satisfies Written Communication and Information Literacy for core).
Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **St*udents wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Sciences for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework.*

Mathematics

*Met with required major coursework.*

Science Technology and Society* (0-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).
Statistics

*Met with required major coursework.*

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Electives (3-35 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation

*Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.

Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).

The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.

Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.

Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

*Any additional information that does not fit into any of the categories above.*

Sample 4-Year Plan

**Fall 1st Year**

- EAPS 11100 - Physical Geology **Credits:** 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 or MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 2.00

15-18 Credits

**Spring 1st Year**

- EAPS 23000 - Laboratory In Atmospheric Science **Credits:** 2.00
- EAPS 22100 - Survey Of Atmospheric Science **Credits:** 3.00 or EAPS 22500 - Science Of The Atmosphere **Credits:** 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Physics Selective I - Credit Hours: 4.00

15-17 Credits

**Fall 2nd Year**

- Physics Selective II - Credit Hours: 4.00
- Science Core First-Year Composition - Credit Hours: 3.00 - 4.00
- Supporting Area Course - Credit Hours: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16-17 Credits
Spring 2nd Year

- **EAPS 11200 - Earth Through Time** Credits: 3.00 - (or 20000 level) - Credit Hours 3.00
- **CS 15900 - C Programming** Credits: 3.00 or
- **CS 17600 - Data Engineering In Python** Credits: 3.00 or
- **CS 17700 - Programming With Multimedia Objects** Credits: 4.00 or
- **CS 18000 - Problem Solving And Object-Oriented Programming** Credits: 4.00
- **STAT 35000 - Introduction To Statistics** Credits: 3.00 or
- **STAT 35500 - Statistics For Data Science** Credits: 3.00 or
- **STAT 50300 - Statistical Methods For Biology** Credits: 3.00 or
- **STAT 51100 - Statistical Methods** Credits: 3.00
- **Supporting Area Course** - Credit Hours: 3.00
- **Science Core Selection** - Credit Hours: 3.00 - 4.00

15-17 Credits

Fall 3rd Year

- **EAPS 22100 - Survey Of Atmospheric Science** Credits: 3.00 or
- **Elective** - Credit Hours: 3.00 (if EAPS 22500 taken)
- **Supporting Area Course** - Credit Hours: 3.00
- **General Chemistry Selective I** - Credit Hours: 4.00 - 5.00
- **Science Core Selection** - Credit Hours: 3.00 - 4.00
- **Elective** - Credit Hours: 3.00

16-18 Credits

Spring 3rd Year

- **COM 21700 - Science Writing And Presentation** Credits: 3.00
- **EAPS 30000 level** - Credit Hours: 3.00
- **General Chemistry Selective II or Elective** - Credit Hours: 4.00- 5.00
- **Science Core Selection** - Credit Hours: 3.00
- **Science Core Selection** - Credit Hours: 3.00

16-17 Credits

Fall 4th Year

- **EAPS 30000 level** - Credit Hours: 3.00
- **Biology Selective I** - Credit Hours: 4.00
- **Supporting Area Course** - Credit Hours: 3.00
- **Great Issues Option** - Credit Hours: 3.00
- **Elective** - Credit Hours: 2.00
15 Credits

Spring 4th Year

- EAPS 30000 level - Credit Hours: 3.00
- Biology Selective II - Credit Hours: 3.00 - 4.00
- Biology Selective II or Elective - Credit Hours: 0.00 - 2.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-18 Credits

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

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Interdisciplinary Science, BS (Mathematics)

About the Interdisciplinary Science Program

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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.

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.

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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)**

**Required Biology Courses (7-8 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

**Option I**
- BIOL 11000 - Fundamentals Of Biology I **Credits: 4.00**
- BIOL 11100 - Fundamentals Of Biology II **Credits: 4.00**

**Option II**
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior **Credits: 2.00**
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms **Credits: 3.00**
- BIOL 13500 - First Year Biology Laboratory **Credits: 2.00**

**Required Chemistry Courses (4-10 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

*Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.*

**Option I**
- CHM 11500 - General Chemistry **Credits: 4.00**
- CHM 11600 - General Chemistry **Credits: 4.00**

**Option II**
- CHM 12500 - Introduction To Chemistry I **Credits: 5.00**
- CHM 12600 - Introduction To Chemistry II **Credits: 5.00**

**Option III**
- CHM 12901 - General Chemistry With A Biological Focus **Credits: 5.00**

**Option IV**
• CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.

• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below; EAPS students must choose Option III.

Option I - for Non-EAPS Concentrations
• EAPS 10000 - Planet Earth Credits: 3.00
Option II - Students who are interested in Geology courses.
• EAPS 10900 - The Dynamic Earth Credits: 3.00
Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
• EAPS 11100 - Physical Geology Credits: 3.00
Option IV - Students who are interested in Atmospheric Science courses.
• EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
Option V - Students who are interested in Atmospheric Science courses.
• EAPS 22500 - Science Of The Atmosphere Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science

Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

Option I
• MA 16010 - Applied Calculus I Credits: 3.00
• MA 16020 - Applied Calculus II Credits: 3.00
Option II - Take one Calculus I and one Calculus II.
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)

Choose one option below; Physics students must choose Option III or Option IV.

Option I
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00
Option II
• PHYS 22000 - General Physics Credits: 4.00
• PHYS 22100 - General Physics Credits: 4.00
Option III
• PHYS 17200 - Modern Mechanics Credits: 4.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
Option IV
• PHYS 17200 - Modern Mechanics
• PHYS 24100 - Electricity And Optics Credits: 3.00
• PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Required Statistics Course (3 credits)

Choose one course below from those noted for your area.

• STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
• STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
• STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
• STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
• STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (35-36 credits)

Required Mathematics Primary Area Courses (17-18 credits)

• MA 35100 - Elementary Linear Algebra Credits: 3.00
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• MA 26200 - Linear Algebra And Differential Equations Credits: 4.00 or
• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00 or
• MA 45300 - Elements Of Algebra I Credits: 3.00 or
• MA 45000 - Algebra Honors Credits: 3.00
• MA Elective at or above 30000 level

Required Supporting Area Courses (18 credits)

MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four-year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

First-Year Composition (3-4 credits)

Choose one course from this list (satisfies Written Communication and Information Literacy for core).

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Sciences for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework.*
Mathematics

Met with required major coursework.

Science Technology and Society* (0-3 credits)
Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

Met with required major coursework.

Team-Building and Collaboration* (0-3 credits)
Choose one from this list.

Electives (4-37 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation
Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:
• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Physics Selective I - Credit Hours: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00

15-18 Credits

Spring 1st Year

• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Physics Selective II - Credit Hours: 4.00
• Science Core - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

• MA 26100 - Multivariate Calculus Credits: 4.00
• EAPS Selective - Credit Hours: 3.00 - 4.00
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
16-17 Credits

Spring 2nd Year

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦ or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 ♦
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- MA 36600 - Ordinary Differential Equations Credits: 4.00 ♦ or
- MA 26200 - Linear Algebra And Differential Equations Credits: 4.00
- Supporting Area Course - Credit Hours: 3.00
- General Chemistry Selective I - Credit Hours: 4.00 - 5.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

15-16 Credits

Spring 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA Elective 30000+ - Credit Hours: 3.00
- Supporting Area Course - Credit Hours: 3.00
- General Chemistry Selective II or Elective - Credit Hours: 4.00 - 5.00
- Science Core Selection - Credit Hours: 3.00

16-17 Credits

Fall 4th Year

- MA 45300 - Elements Of Algebra I Credits: 3.00 ♦ or
- MA 45000 - Algebra Honors Credits: 3.00 ♦ or
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• Biology Selective I - Credit Hours: 4.00
• Supporting Area Course - Credit Hours: 3.00
• Great Issue Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00

16 Credits

Spring 4th Year

• Biology Selective II - Credit Hours: 3.00 - 4.00
• Biology Selective II or Elective - Credit Hours: 2.00
• Supporting Area Course - Credit Hours: 3.00
• Elective - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

14-16 Credits

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Interdisciplinary Science, BS (Physics)
About the Interdisciplinary Science 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.

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.

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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second
majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)**

**Required Biology Courses (7-8 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

**Option I**
- BIOL 11000 - Fundamentals Of Biology I *Credits: 4.00*
- BIOL 11100 - Fundamentals Of Biology II *Credits: 4.00*

**Option II**
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior *Credits: 2.00*
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms *Credits: 3.00*
- BIOL 13500 - First Year Biology Laboratory *Credits: 2.00*

**Required Chemistry Courses (4-10 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.

**Option I**
- CHM 11500 - General Chemistry *Credits: 4.00*
- CHM 11600 - General Chemistry *Credits: 4.00*
Option II
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

Option III
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Option IV
- CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following: Computer Science students must choose CS 18000.
- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below; EAPS students must choose Option III.
- Option I - for Non-EAPS Concentrations
  - EAPS 10000 - Planet Earth Credits: 3.00
- Option II - Students who are interested in Geology courses.
  - EAPS 10900 - The Dynamic Earth Credits: 3.00
- Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
  - EAPS 11100 - Physical Geology Credits: 3.00
- Option IV - Student who are interested in Atmospheric Science courses.
  - EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00
  - EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
- Option V - Student who are interested in Atmospheric Science courses.
  - EAPS 22500 - Science Of The Atmosphere Credits: 3.00
  - EAPS 23000 - Laboratory In Atmospheric Science

Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.
- Option I
  - MA 16010 - Applied Calculus I Credits: 3.00
  - MA 16020 - Applied Calculus II Credits: 3.00
- Option II - Take one Calculus I and one Calculus II.
  - MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
  - MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
  - MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
  - MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)
Choose one option below: Physics students must choose Option III or Option IV.

Option I
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00

Option II
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00

Option III
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00

Option IV
- PHYS 17200 - Modern Mechanics
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Required Statistics Course (3 credits)

Choose one course below from those noted for your area.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
- STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
- STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
- STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (31-32 credits)

Required Physics Primary Area Courses (13-14 credits)

- MA 26100 - Multivariate Calculus Credits: 4.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- PHYS Elective at or above 30000 level - Credit Hours: 3.00
- PHYS Elective at or above 30000 level - Credit Hours: 3.00

Required Supporting Area Courses (18 credits)

MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**First-Year Composition (3-4 credits)**

Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

**Technical Writing And Presentation* (0-6 credits)**

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science**

*Met with required major coursework.*
Mathematics

Met with required major coursework.

Multidisciplinary Experience\(^*\) (0-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

Met with required major coursework.

Team-Building and Collaboration\(^*\) (0-3 credits)

Met with required major coursework.

Electives (4-37 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences\(^*\), including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
- Technical Presentation
*Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

**College of Science Pass/No Pass Option Policy**

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

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**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the [Civics Literacy Proficiency Website](#).

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:
• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• PHYS 17200 - Modern Mechanics Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00

15-18 Credits

Spring 1st Year

• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 0.00 - 1.00

15-17 Credits

Fall 2nd Year

• MA 26100 - Multivariate Calculus Credits: 4.00
• PHYS 34400 - Introduction To Quantum Science Credits: 4.00
• Supporting Area Course - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
16-18 Credits

Spring 2nd Year

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ 
• PHYS 30000+ Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Supporting Area Course - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 3rd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• PHYS 30000+ Credit Hours: 3.00
• Supporting Area Course - Credit Hours: 3.00
• General Chemistry Selective I - Credit Hours: 4.00 - 5.00
• Science Core Selection - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• EAPS Selective - Credit Hours: 3.00 - 4.00
• Supporting Area Course - Credit Hours: 3.00
• General Chemistry Selective II or Elective - Credit Hours: 4.00 - 5.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

16-18 Credits

Fall 4th Year

• STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ or
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦ or
• STAT 50300 - Statistical Methods For Biology Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Biology Selective I - Credit Hours: 4.00
• Supporting Area Course - Credit Hours: 3.00
• Great Issues Option - Credit Hours: 3.00
Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

- Supporting Area Course - Credit Hours: 3.00
- Biology Selective II - Credit Hours: 3.00 - 4.00
- Biology Selective II or Elective - Credit Hours: 2.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 4.00-6.00

15-18 Credits

Critical Course

The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

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Interdisciplinary Science, BS (Statistics)

About the Interdisciplinary Science 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.

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.

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, lay and other advanced-study professions, scientific sales, technical and scientific writing, computer programming and engineering.

Interdisciplinary Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses: Interdisciplinary Science (34-47 credits)**

**Required Biology Courses (7-8 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

**Option I**
- BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
- BIOL 11100 - Fundamentals Of Biology II Credits: 4.00

**Option II**
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00

**Required Chemistry Courses (4-10 credits)**

*Choose one option below. Select courses COULD satisfy Science for Core.*

Chemistry students must also take the departmental exam for CHM 11500 if they choose Option III.

**Option I**
- CHM 11500 - General Chemistry Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00

**Option II**
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

**Option III**
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
• CHM 13600 - General Chemistry Honors Credits: 4.00

Required Computing Option (3-4 credits)

Choose one of the following; Computer Science students must choose CS 18000.

• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Earth, Atmospheric, and Planetary Science Option (3-4 credits)

Choose one option below; EAPS students must choose Option III.

Option I - for Non-EAPS Concentrations
• EAPS 10000 - Planet Earth Credits: 3.00
Option II - Students who are interested in Geology courses.
• EAPS 10900 - The Dynamic Earth Credits: 3.00
Option III - Students who are interested in Environmental, Geology, and Planetary Sciences courses
• EAPS 11100 - Physical Geology Credits: 3.00
Option IV - Students who are interested in Atmospheric Science courses.
• EAPS 22100 - Survey Of Atmospheric Science Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science Credits: 2.00
Option V - Students who are interested in Atmospheric Science courses.
• EAPS 22500 - Science Of The Atmosphere Credits: 3.00
• EAPS 23000 - Laboratory In Atmospheric Science

Required Mathematics Courses (6-10 credits)

Choose one option below; only Chemistry or Biology students may choose Option I. Satisfies Quantitative Reasoning for Core.

Option I
• MA 16010 - Applied Calculus I Credits: 3.00
• MA 16020 - Applied Calculus II Credits: 3.00
Option II - Take one Calculus I and one Calculus II.
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Courses (8 credits)

Choose one option below; Physics students must choose Option III or Option IV.

Option I
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00
Option II
Required Statistics Course (3 credits)

Choose one course below from those noted for your area.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (Chemistry, EAPS or Physics concentrations only)
- STAT 35000 - Introduction To Statistics Credits: 3.00 (All areas)
- STAT 35500 - Statistics For Data Science Credits: 3.00 (All areas)
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (Biology, Chemistry, EAPS, Math, or Physics concentrations only)
- STAT 51100 - Statistical Methods Credits: 3.00 (Chemistry, Computer Science, EAPS or Physics concentrations only)

Departmental/Program Major Courses: Areas (30-31 credits)

Required Statistics Primary Area Courses (12-13 credits)

- STAT 22500 - Introduction To Probability Models Credits: 3.00 or
- STAT 31100 - Introductory Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00 or
- STAT 51300 - Statistical Quality Control Credits: 3.00 or
- STAT 51400 - Design Of Experiments Credits: 3.00 or
- MA 26100 - Multivariate Calculus Credits: 4.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00

AND

- STAT 51300 - Statistical Quality Control or
- STAT 51400 - Design Of Experiments

NOTE: STAT 51300 and STAT 51400 can only be taken one time each to meet primary area course requirements.

Required Supporting Area Courses (18 credits)

MUST BE APPROVED BY COLLEGE. Please see your advisor for approval options.

Other Departmental/Program Course Requirements (15-37 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS
Composition & Presentation

First-Year Composition (3-4 credits)

Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science
Met with required major coursework.

Mathematics

Met with required major coursework.

Science Technology and Society* (0-3 credits)

Choose one from this list (satisfies Science, Technology, Society for core).

Statistics

Met with required major coursework.

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Electives (5-38 credits)

Interdisciplinary Science Other Requirements

GPA Requirement

- Concentration and Supporting Area blocks require a minimum 2.00 GPA.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- All courses can share with the exception of the Great Issues, General Education and Cultural Diversity (Language & Culture) Courses.

Non-course / Non-credit Requirements

College of Science students may choose to complete one or more of following core Science requirements through approved learning experiences*, including, but not limited to: internships, co-ops, research, Study Abroad, Entrepreneurship and EPICS projects.

- Teaming
- Language and Culture
- Multidisciplinary (Research)
- Multidisciplinary (Internship)
- Technical Writing
• Technical Presentation

*Experiential Learning Contracts must be completed one semester prior to a student's anticipated graduation date.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option. Transfer credit (including any/all undistributed credit, TR graded course, AP/IB credit, etc.) cannot be applied to the concentration.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.
Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Physics Selective I - Credit Hours: 4.00
- Elective - Credit Hours: 1.00

15-18 Credits

Spring 1st Year

- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Physics Selective II - Credit Hours: 4.00
- Elective - Credit Hours: 1.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- STAT 41700 - Statistical Theory Credits: 3.00 or
- STAT 51300 - Statistical Quality Control Credits: 3.00 or
- STAT 51400 - Design Of Experiments Credits: 3.00
Note: MA 26100 can be taken this semester. If another choice is selected, it will need to be moved down in the plan of study to accommodate pre-requisites.

- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- EAPS Selective - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 2nd Year

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

15-16 Credits

Fall 3rd Year

- STAT 22500 - Introduction To Probability Models Credits: 3.00 or
- STAT 31100 - Introductory Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- General Chemistry Selective I - Credit Hours: 4.00 - 5.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15-16 Credits

Spring 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- General Chemistry Selective II or Elective - Credit Hours: 4.00 - 5.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

16-17 Credits
Fall 4th Year

- STAT 51200 - Applied Regression Analysis Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Biology Selective I - Credit Hours: 4.00
- Great Issues Option - Credit Hours: 3.00

16 Credits

Spring 4th Year

- STAT 51300 - Statistical Quality Control Credits: 3.00 or
- STAT 51400 - Design Of Experiments Credits: 3.00
- Supporting Area Course - Credit Hours: 3.00
- Biology Selective II - Credit Hours: 3.00 - 4.00
- Biology Selective II or Elective - Credit Hours: 0.00 - 2.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours - 0.00 - 3.00

15 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
Science Education - Biology Concentration, BS

About the Science Education Program

A College of Science degree in Science Education prepares future science teachers for certification at the middle and high school level. Students customize their focus by selecting a major area of study in biology, chemistry, physics, or earth and space science within an interdisciplinary science framework. The Science Education degree ensures students are thoroughly educated in their content discipline and modern theories of learning and education. Graduates are in high demand as STEM education and careers continue to grow in demand.

This program meets state and national licensure standards and is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the State of Indiana, State Board of Education. See Teacher Licensure Information in the plan below.

Science Education Major Change (CODO) Requirements

Degree Requirements

124 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses

**Biology Concentration 2.50 GPA**: Overall GPA for Biology Concentration courses with the Departmental/Program Major Courses must be 2.50 or greater. This includes all courses under the Science Education Core plus all courses in the Biology Concentration.

**Required Science Education Core Courses (25-30 credits)**

Overall GPA for Biology Concentration courses with the Departmental/Program Major Courses must be \( \geq 2.50 \). This includes all courses under the Science Education Core plus all courses in the Biology Concentration.

**Required Chemistry Course (4-5 credits)**

*Biology* students must take CHM 12901; *Chemistry, Earth/Space, and Physics* students choose CHM 11500 or CHM 12500.

- CHM 11500 - General Chemistry Credits: 4.00 ♦ (CHEM, ESSE, or PHYS) or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ (CHEM, ESSE, or PHYS) or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦ (BIOL only)

**Required Computing Option (3-4 credits)**

*Choose one.*

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ or
- TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II.

**Required Calculus Courses (6-10 credits)**

*Choose one sequence available for your concentration.* (satisfies Quantitative Reasoning for core)
Option 1 (all concentrations)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00

Option 2 (all concentrations)

- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Option 3 (Biology only)

- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16020 - Applied Calculus II Credits: 3.00

Required Physics Courses (8 credits)

Choose one sequence available for your concentration. (satisfies Science for core)

Option 1 (Biology, Chemistry, Earth/Space)

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00

Option 2 (Physics only)

- PHYS 17200 - Modern Mechanics Credits: 4.00 - HONORS version required
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 - HONORS version required

Option 3 (Biology, Chemistry, Earth/Space)

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Option 4 (Earth/Space only)

- PHYS 22000 - General Physics Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00

Option 5 (Biology only)

- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00

Required Statistics Course (3 credits)
Choose one available for your concentration.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (CHEM, ESSE, PHYS) or
- STAT 35000 - Introduction To Statistics Credits: 3.00 (CHEM) or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (BIOL)

Biology Concentration (37 credits)

Overall GPA for Biology Concentration courses with the Departmental/Program Major Courses must be ≥ 2.50. This includes all courses under the Science Education Core plus all courses in the Biology Concentration.

Biology Core (19 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (satisfies STS for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 13100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 13100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00 ♦
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00 ♦
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (10-12 credits)

Must have at least 10 credits of coursework, including courses which meet each of the following categories: "Intermediate," "Group A," "Group B," "BIOL 500-level," and "Base Lab Requirement."

Courses may double-dip among requirements; if used multiple places, course credits will only count once towards the required 10 credits of Upper-Level Biology Coursework. Any excess Upper-Level Biology Coursework beyond 12 credits will count as free "electives."

Intermediate Selective (0-4 credits)

Choose one of the options below. All options are also listed under either Group A or Group B selective. A course may double-dip among requirements; if used multiple places, course credits will only count once towards the required 10 credits of Upper-Level Biology Coursework.

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
Group A Selective (at least 2 credits)

Course may overlap with other major requirements.

- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 44400 - Human Medical Genetics Credits: 3.00
- BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
- BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
- BIOL 48100 - Eukaryotic Genetics Credits: 3.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
- BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
- BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
- BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
- BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
- BIOL 52900 - Bacterial Physiology Credits: 3.00
- BIOL 53300 - Medical Microbiology Credits: 3.00
- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
- BIOL 54100 - Molecular Genetics Of Bacteria Credits: 3.00
- BIOL 54900 - Microbial Ecology Credits: 2.00
- BIOL 56200 - Neural Systems Credits: 3.00
- BIOL 56310 - Protein Bioinformatics Credits: 3.00
- BCHM 43400 - Medical Topics In Biochemistry Credits: 3.00
- BCHM 56100 - General Biochemistry I Credits: 3.00
- BCHM 56200 - General Biochemistry II Credits: 3.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 43300 - Biochemistry Credits: 3.00

Group B Selective (at least 2 credits)

Course may overlap with other major requirements.

- BIOL 20400 - Human Anatomy And Physiology Credits: 4.00
- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 53700 - Immunobiology Credits: 3.00
- BIOL 58000 - Evolution Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58601 - Ecology Credits: 3.00
• BIOL 58705 - Animal Communication Credits: 3.00
• BIOL 59100 - Field Ecology Credits: 3.00 or 4.00
• BIOL 59200 - The Evolution Of Behavior Credits: 3.00
• HORT 30100 - Plant Physiology Credits: 4.00

BIOL 500-level Selective (0 or 2-3 credits)

Select one 3-credit BIOL 500-level course from Group A or Group B (course may double-dip between requirements).

Base Lab Requirement (0-4 credits)

Click Base Lab Requirements for all Biology majors for additional lists. Courses used for the Base Lab Requirement may also count for other major requirements.

Additional Selective Courses (0-7 credits)

Additional courses if needed to reach 10 credits total Upper Level Biology Coursework.

Can either be additional courses from Groups A or B or the 'Base Lab Requirement' above, or from the lists below.

Undergraduate Research (0-2 credits)

A maximum of 2 credits total (combined BIOL 49400/49900) can count towards the "Upper-Level Biology Coursework" tally (any credits beyond two count as free "electives").

NOTE: if using Undergraduate Research towards the "Base Lab Requirement": Objectives A and/or B, FOUR credits must be accumulated, plus the Research Mentor's approval as one or both Objectives. However, only TWO credits contribute to the "Upper-Level Biology Coursework" minimum of 10 credits.

• BIOL 49400 - Biology Research Credits: 1.00 to 4.00
• BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00

Academic Seminars/Other Courses

• BIOL 44100 - Biology Senior Seminar In Genetics Credits: 1.00
• BCHM 52100 - Comparative Genomics Credits: 3.00

Organic Chemistry (8 credits)

Organic Chemistry I

• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00

Organic Chemistry II

• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
Professional Education Requirements (43-44 credits)

All required Professional Education, and Learner Specialty Pathway courses are calculated into the 2.5 Overall Teacher Education GPA requirement with no grade lower than a "C".

- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦ (2 credits; satisfies Written Communication for core)
- EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00 (1 credit required; satisfies Information Literacy for core)
- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦ (2 credits required; satisfies Behavioral & Social Sciences for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00 (1 credit required)
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00 (1 credit required)
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
- EDCI 42100 - The Teaching Of Biology In Secondary Schools Credits: 3.00
- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00 (12 credits required)
- EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00 (2 credits required)
- EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
- EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
- EDPS 26501 - The Inclusive Classroom Credits: 2.00
- EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00 (1 credit required)
- EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00 (2 credits required)
- EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00 (2 credits required)
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00 (1 credit required)
- EDCI 42800 - Teaching Science In The Middle And Junior High School or
- EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00

Learner Specialty Pathway Selective

Choose one course from one of the learner specialty pathway areas below. Students can elect to take additional coursework to complete a full concentration if they choose, but is not required. See the links for concentration requirements.

If you desire additional information regarding the Learner Specialty Pathway Concentrations, please reach out to your academic advisor or visit the Learner Specialty Concentrations tab found here.

English Language Learners
- EDCI 31950 - Approaches To English Learner Education Credits: 3.00
- EDCI 32650 - Introduction To Linguistics And Language Acquisition In Education Credits: 3.00
  High Ability - All courses must be completed with a B- or better average.
- EDPS 54200 - Curriculum And Program Development In Gifted Education Credits: 3.00
- EDPS 54500 - Social And Affective Development Of Gifted Students Credits: 3.00
Special Education
- EDPS 21100 - Special Education Law, Policy, And Ethical Guidelines Credits: 3.00
Applied Behavior Analysis

- EDPS 34100 - Introduction To Philosophical Underpinnings And Concepts Of Applied Behavior Analysis
  Credits: 3.00
- EDPS 34200 - Applied Behavior Analysis - Assessment And Intervention
  Credits: 3.00

Optional Concentration

K-12 Integrated STEM Optional Concentration for Education

Other Departmental /Program Course Requirements (9-21 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication

Met with EDCI 20500. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework (CS 15900, CS 17600, CS 17700, CS 18000, or TDM10100 and TDM10200).

Cultural Diversity (Language & Culture)^* (0-6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - Met with EDCI 28500
- Language & Culture Option II
- Language & Culture Option III
General Education\(^\text{a}\) (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - met with EDPS 23500
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework (BIOL 12100/13100/13500).*

Mathematics

*Met with required major coursework (MA 16100/16200; MA 16500/16600; MA 16010/16020).*

Science, Technology and Society

*Met with BIOL 12100 in major. (satisfies STS for core)*

Statistics

*Met with required major coursework (STAT 50300).*

Team-Building and Collaboration

*Met with EDCI 49800 in major.*

Electives (0-10 credits)

GPA Requirements

- 2.0 average in courses used for Biology Core and Upper-Level Selectives required to graduate.
- 2.5 average in Biology concentration courses required to graduate.
- 2.0 Graduation GPA is required for the Bachelor of Science degree.
- 2.5 Overall GPA is required for the Teacher Education Program.

Teacher Licensure Information

Successful completion of the Purdue University Science Education-Biology Concentration Program, Science Education-Biology, BS, and the State of Indiana licensure requirements results in an Indiana initial instructional License in Life Sciences (5-12), and
Blended and Online Teaching (5-12). Contact the Office of Teacher Education and Licensure for additional information regarding Teacher Education and licensure requirements.

Office of Teacher Education and Licensure

Teacher Education Program (TEP) Requirements and Milestones

Indiana Licensure information - Each student must meet all degree, program, and licensure requirements prior to being recommended for licensure.

- 2.5 Overall GPA is required for the Teacher Education Program.
- Students must successfully progress through Milestone A to enroll in any Professional Education **Restricted Methods course.
- Successful completion of all Major, Professional Education (including all Foundations Courses with linked Foundations Portfolio Common Assessments and **Restricted Methods Courses), Learner Specialty Concentration/Pathway, and degree courses are required prior to Milestone C. Program limitations restrict additional courses to be taken simultaneously with or following student teaching without advance authorization.
- Successful completion of all Foundations Portfolio Common Assessments are required prior to Milestone D.
- Blended and online Teaching licensure requirements are embedded into coursework for all Undergraduate Licensure Programs.
- Beginning July 1, 2025 - According to the Indiana State Board of Education, students seeking an Initial Indiana License in a content area involving literacy instruction, including special education, must obtain an early literacy endorsement, Science of Reading (P-5), as required under IC 20-28-5-19.7.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.
University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

- This degree is intended to give students many options. Students need to consult with a College of Science Academic Advisor regarding requirements.

Sample 4-Year Plan

Fall 1st Year
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦
- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00

First Year Biology Lab Selective Credit Hours: 2.00
- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 recommended)

16-18 Credits

Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection Language & Culture - Credit Hours: 3.00

16-18 Credits

Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00 ♦
- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00
- EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
- EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- Science Core Selection General Education - Credit Hours: 3.00

15 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00 ♦
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00
- EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
- EDPS 26501 - The Inclusive Classroom Credits: 2.00
- Science Core Selection Language & Culture - Credit Hours: 3.00

16 Credits

Fall 3rd Year

- EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Intermediate Biology Selective - Credit Hours: 3.00 - 4.00
- Group A Selective - Credit Hours: 2.00 - 3.00
- Science Core Selection General Education - Credit Hours: 3.00
- Learner Pathway Selective - Credit Hours: 3.00

17-18 Credits

Spring 3rd Year

- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦
- EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
- EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods- Secondary Credits: 3.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Group B Selective - Credit Hours: 2.00
- Science Core Selection TW/TP - Credit Hours: 3.00
- Elective (BIOL 39300 recommended) - Credit Hours: 1.00

15-17 Credits

Fall 4th Year

- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- EDCI 42100 - The Teaching Of Biology In Secondary Schools Credits: 3.00
- EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00
- EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00
- Base Lab Requirement - Credit Hours: 2.00 - 4.00
- 50000 Level Biology Selective - Credit Hours: 3.00 - 4.00
- Science Core Selection Great Issues In Science - Credit Hours: 3.00

**17-19 Credits**

**Spring 4th Year**

- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00

**12 Credits**

**World Language Courses**

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

**Critical Course**

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

**Disclaimer**

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Science Education - Chemistry Concentration, BS**

**About the Science Education Program**

A College of Science degree in Science Education prepares future science teachers for certification at the middle and high school level. Students customize their focus by selecting a major area of study in biology, chemistry, physics, or earth and space science within an interdisciplinary science framework. The Science Education degree ensures students are thoroughly educated in their
content discipline and modern theories of learning and education. Graduates are in high demand as STEM education and careers continue to grow in demand.

This program meets state and national licensure standards and is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the State of Indiana, State Board of Education. See Teacher Licensure Information in the plan below.

Science Education Major Change (CODO) Requirements

Degree Requirements

124 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses

Required Science Education Core Courses (26-30 credits)

Overall GPA for Chemistry Concentration courses with the Departmental/Program Major Courses must be ≥ 2.50. This includes all courses under the Science Education Core plus all courses in the Chemistry Concentration unless otherwise indicated.

Required Chemistry Course (4-5 credits)

(satisfies Science for University Core)

- CHM 11500 - General Chemistry Credits: 4.00 or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00

Required Computing Option (3-4 credits)

Choose one. NOT included in the CONTENT GPA.

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Calculus Selective Courses (8-10 credits)

(satisfies Quantitative Reasoning for University Core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Required Physics Selective Courses (8 credits)

- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
  OR
- PHYS 24100 - Electricity And Optics Credits: 3.00 and
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00
OR
- PHYS 22100 - General Physics Credits: 4.00

Required Statistics Course (3 credits)

Choose one available for your concentration. NOT included in the CONTENT GPA.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00

Chemistry Concentration (39-44 credits)

Overall GPA for Chemistry Concentration courses with the Departmental/Program Major Courses must be \( \geq 2.50 \) (CONTENT GPA). This includes all courses under the Science Education Core plus all courses in the Chemistry Concentration unless otherwise indicated.

Required Concentration Courses (19-20 credits)

- CHM 11600 - General Chemistry Credits: 4.00 (satisfies Science for core) or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 22400 - Introductory Quantitative Analysis Credits: 4.00
- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- CHM 26505 - Organic Chemistry I Credits: 3.00
- CHM 26605 - Organic Chemistry II Credits: 3.00

Biochemistry Selective (3 credits)

Choose one.

- BCHM 30700 - Biochemistry Credits: 3.00
- BCHM 56100 - General Biochemistry I Credits: 3.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 43300 - Biochemistry Credits: 3.00

Physical Chemistry Selective (4-7 credits)

- CHM 37200 - Physical Chemistry Credits: 4.00
  OR
- CHM 37300 - Physical Chemistry I Credits: 3.00 and
- CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00 and
- CHM 37400 - Physical Chemistry II Credits: 3.00

Upper Level Selective (3 credits)

Choose one.

- CHM 34200 - Inorganic Chemistry Credits: 3.00
• CHM 43800 - Introduction To Molecular Biotechnology Credits: 3.00
• CHM 46200 - Intermediate Organic Chemistry Credits: 3.00
• CHM 49900 - Special Assignments Credits: 1.00 to 5.00 Undergraduate Research - Credit Hours: 3.00

Analytical Selective (4 credits)
Choose one.
• CHM 32100 - Analytical Chemistry I Credits: 4.00
• CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
• CHM 42400 - Instrumental Analysis Credits: 4.00

Required Lab Selective (3-6 credits)
Courses cannot double count with Required Analytical Selectives.
Choose One Area:

Area 1
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
• CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00

Area 2
• CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
• CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00

Area 3
• CHM 26300 - Organic Chemistry Laboratory I Credits: 1.00 or
• CHM 26400 - Organic Chemistry Laboratory II Credits: 1.00

AND Must choose one course from the list below:
• CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
• CHM 32100 - Analytical Chemistry I Credits: 4.00
• CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
• CHM 42400 - Instrumental Analysis Credits: 4.00
• CHM 49900 - Special Assignments Credits: 1.00 to 5.00 - Credit Hours: 1.00

Professional Education Requirements (43-44 credits)

All required Professional Education, and Learner Specialty Pathway courses are calculated into the 2.5 Overall Teacher Education GPA requirement with no grade lower than a "C".

• EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
• EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 (2 credits required; satisfies Written Communication for core)
• EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00 (1 credit required; satisfies Information Literacy for University Core)
• EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 &diams; (2 credits required; satisfies Behavioral & Social Sciences for University Core)
• EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00 (1 credit required)
• EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00 (1 credit required)
• EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
• EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
• EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00
• EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
• EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00 (2 credits required; satisfies Behavioral & Social Sciences for University Core)
• EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
• EDCI 32650 - Introduction To Linguistics And Language Acquisition In Education Credits: 3.00
• EDCI 26501 - The Inclusive Classroom Credits: 2.00
• EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00 (1 credit required)
• EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00 (2 credits required)
• EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00 (2 credits required)
• EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00 (1 credit required)
• EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or 3.00 (2 credits required)
• EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00

Learner Specialty Pathway Selective (3 credits)

Choose one course from one of the learner specialty pathway areas below. Students can elect to take additional coursework to complete a full concentration if they choose, but is not required. See the links for concentration requirements.

If you desire additional information regarding the Learner Specialty Pathway Concentrations, please reach out to your academic advisor or visit the Learner Specialty Concentrations tab found here.

**English Language Learners**
- EDCI 31950 - Approaches To English Learner Education Credits: 3.00
- EDCI 32650 - Introduction To Linguistics And Language Acquisition In Education Credits: 3.00
  **High Ability** - All courses must be completed with a B- or better average.
- EDPS 54200 - Curriculum And Program Development In Gifted Education Credits: 3.00
- EDPS 54500 - Social And Affective Development Of Gifted Students Credits: 3.00

**Special Education**
- EDPS 21100 - Special Education Law, Policy, And Ethical Guidelines Credits: 3.00
  **Applied Behavior Analysis**
- EDPS 34100 - Introduction To Philosophical Underpinnings And Concepts Of Applied Behavior Analysis Credits: 3.00
- EDPS 34200 - Applied Behavior Analysis - Assessment And Intervention Credits: 3.00

**Optional Concentration**

K-12 Integrated STEM Optional Concentration for Education

**Other Departmental /Program Course Requirements (10-24 credits)**
COLLEGE OF SCIENCE CORE REQUIREMENTS

^- Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication

Met with EDCI 20500 (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework (CS 15900, 17600, 17700, 18000).

Cultural Diversity (Language & Culture)^* (0-6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - Met with EDCI 28500
- Language & Culture Option II
- Language & Culture Option III

General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - met with EDPS 23500
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.
Laboratory Science

*Met with required major coursework (CHM 11500/11600; CHM 12500/12600).*

Mathematics

*Met with required major coursework (MA 16100/16200; MA 16500/16600).*

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics

*Met with required major coursework.*

Team-Building and Collaboration

*Met with EDCI 49800 in major.*

Electives (0-6 credits)

Teacher Licensure Information

Successful completion of the Purdue University Science Education-Chemistry Concentration Program, Science Education-Chemistry, BS, and the State of Indiana licensure requirements results in an Indiana initial instructional License in Chemistry (5-12), and Blended and Online Teaching (5-12). Contact the Office of Teacher Education and Licensure for additional information regarding Teacher Education and licensure requirements.

Office of Teacher Education and Licensure

Teacher Education Program (TEP) Requirements and Milestones

Indiana Licensure information - Each student must meet all degree, program, and licensure requirements prior to being recommended for licensure.

- 2.5 Overall GPA is required for the Teacher Education Program.
- Students must successfully progress through Milestone A to enroll in any Professional Education **Restricted Methods course.
- Successful completion of all Major, Professional Education (including all Foundations Courses with linked Foundations Portfolio Common Assessments and **Restricted Methods Courses), Learner Specialty Concentration/Pathway, and degree courses are required prior to Milestone C. Program limitations restrict additional courses to be taken simultaneously with or following student teaching without advance authorization.
- Successful completion of all Foundations Portfolio Common Assessments are required prior to Milestone D.
- Blended and online Teaching licensure requirements are embedded into coursework for all Undergraduate Licensure Programs.
- Beginning July 1, 2025 - According to the Indiana State Board of Education, students seeking an Initial Indiana License in a content area involving literacy instruction, including special education, must obtain an early literacy endorsement, Science of Reading (P-5), as required under IC 20-28-5-19.7.
GPA Requirements

- 2.0 average in CHM courses required to graduate.
- 2.5 average or above in Chemistry Content courses required to graduate
- 2.0 Graduation GPA required for the Bachelor of Science degree.
- 2.5 Overall GPA is required for the Teacher Education Program.
- Overall GPA for Chemistry Concentration courses with the Departmental/Program Major Courses must be \( \geq 2.50 \). This includes all courses under the Science Education Core plus all courses in the Chemistry Concentration unless otherwise indicated.

Course Requirements and Notes

- No Count Courses are not allowed for credit
- Overlapping Course Content courses - only one course can be used for courses considered to have overlapping content.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

• This degree is intended to give students many options. Students need to consult with a College of Science Academic Advisor regarding requirements.

Sample 4-Year Plan

Fall 1st Year

• CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
• EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00
• EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00
• CHM 11500 - General Chemistry Credits: 4.00 or
• CHM 12500 - Introduction To Chemistry I Credits: 5.00
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection General Education - Credit Hours: 3.00
15-17 Credits

Spring 1st Year

- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 or
- CHM 13600 - General Chemistry Honors Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- CHM 11600 - General Chemistry Credits: 4.00
- Science Core Selection - Credit Hours: 3.00

18-20 Credits

Fall 2nd Year

- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00
- EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
- EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00
- CHM 26505 - Organic Chemistry I Credits: 3.00 or
- CHM 26100 - Organic Chemistry I Credits: 3.00
- CHM 26300 - Organic Chemistry Laboratory I Credits: 1.00 or
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00
- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

15-17 Credits

Spring 2nd Year

- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- EDCI 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00
- EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
- EDPS 26501 - The Inclusive Classroom Credits: 2.00
- CHM 26605 - Organic Chemistry II Credits: 3.00 or
- CHM 26200 - Organic Chemistry II Credits: 3.00
- CHM 26400 - Organic Chemistry Laboratory II Credits: 1.00 or
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
• CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 Electricity And Optics Laboratory

18-19 Credits

Fall 3rd Year

• CHM 37300 - Physical Chemistry I Credits: 3.00
• CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
• EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00
• EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00
• STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
• STAT 35000 - Introduction To Statistics Credits: 3.00
• Science Core Selection TWTP (COM 21700 strongly recommended) - Credit Hours: 3.00
• Science Core Selection Language & Culture - Credit Hours: 3.00

15 Credits

Spring 3rd Year

• CHM 34200 - Inorganic Chemistry Credits: 3.00
• CHM 37400 - Physical Chemistry II Credits: 3.00
• CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
• EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00
• Science Core Selection General Education - Credit Hours: 3.00

16-17 Credits

Fall 4th Year

• EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
• EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00
• EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00
• CHM 32100 - Analytical Chemistry I Credits: 4.00 or
• CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00 or
• CHM 43300 - Biochemistry Credits: 3.00 or
• BCHM 56100 - General Biochemistry I Credits: 3.00
• Science Core Selection Great Issues - Credit Hours: 3.00

16 Credits

Spring 4th Year

• EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00

12 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
Science Education - Earth Space Science Concentration, BS

About the Science Education Program

A College of Science degree in Science Education prepares future science teachers for certification at the middle and high school level. Students customize their focus by selecting a major area of study in biology, chemistry, physics, or earth and space science within an interdisciplinary science framework. The Science Education degree ensures students are thoroughly educated in their content discipline and modern theories of learning and education. Graduates are in high demand as STEM education and careers continue to grow in demand.

This program meets state and national licensure standards and is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the State of Indiana, State Board of Education. See Teacher Licensure Information in the plan below.

Science Education Major Change (CODO) Requirements

Degree Requirements

124 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:
- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses**

**Required Science Education Core Courses (24-30 credits)**

Overall GPA for Earth Space Concentration courses with the Departmental/Program Major Courses must be ≥ 2.50. This includes all courses under the Science Education Core plus all courses in the Earth Space Concentration unless otherwise indicated.

**Required Chemistry Course (4-5 credits)**

*Biology students must take CHM 12901; Chemistry, Earth/Space, and Physics students choose CHM 11500 or CHM 12500. (satisfies Science for core)*

- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

**Required Computing Option (3-4 credits)**

*Choose one available for your concentration. Meets College of Science Computing Requirement. NOT included in CONTENT GPA.*

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

**Required Calculus Selective Courses (6-10 credits)**

*Choose one sequence available for your concentration. (satisfies Quantitative Reasoning for core). NOT included in CONTENT GPA.*
Option 1 (all concentrations)
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00

Option 2 (all concentrations)
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Option 3 (Biology only)
- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16020 - Applied Calculus II Credits: 3.00

Required Physics Selective Courses (8 credits)
Choose one sequence available for your concentration. (satisfies Science for core)

Option 1 (Biology, Chemistry, Earth/Space)
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00

Option 2 (Physics only)
- PHYS 17200 - Modern Mechanics Credits: 4.00 - HONORS version required
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 - HONORS version required

Option 3 (Biology, Chemistry, Earth/Space)
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Option 4 (Earth/Space only)
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00

Option 5 (Biology only)
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00

Required Statistics Course (3 credits)
Choose one available for your concentration. Meets College of Science Statistics Requirement. NOT included in CONTENT GPA.

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ (CHEM, ESSE, PHYS; satisfies Information Literacy for core) or
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ (CHEM) or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 ♦ (BIOL)

Earth Space Science Concentration (32-33 credits)

Overall GPA for Earth Space Concentration courses with the Departmental/Program Major Courses must be ≥ 2.50. This includes all courses under the Science Education Core plus all courses in the Earth Space Concentration unless otherwise indicated.

- EAPS 10500 - The Planets Credits: 3.00 (satisfies Science for core)
- EAPS 11700 - Introduction To Atmospheric Science Credits: 3.00 (satisfies Science for core)
- EAPS 20000 - Water World: Processes And Challenges In Global Hydrology Credits: 3.00 (satisfies Science, Technology, Society for core)
- EAPS 24300 - Mineralogy Credits: 4.00 ♦ (satisfies Science for core)
- EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
- EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
- EAPS 39000 - Geologic Field Methods Credits: 3.00
- CHM 11600 - General Chemistry Credits: 4.00 ♦ (satisfies Science for core) or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 ♦ (satisfies Science for core) or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦ or
- CHM 13600 - General Chemistry Honors Credits: 4.00 ♦ (satisfies Science for core)
- EAPS 10900 - The Dynamic Earth Credits: 3.00 (satisfies Science for core) or
- EAPS 11200 - Earth Through Time Credits: 3.00 (satisfies Science for core)
- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00 ♦ or
- EAPS 11100 - Physical Geology Credits: 3.00 (satisfies Science for University Core)

Professional Education Requirements (43-44 credits)

All required Professional Education, and Learner Specialty Pathway courses are calculated into the 2.5 Overall Teacher Education GPA requirement with no grade lower than a "C".

- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦ (2 credits required; satisfies Written Communication for core)
- EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00 (1 credit required; satisfies Information Literacy for core)
- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦ (2 credits required; satisfies BSS for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00 (1 credit required)
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00 (1 credit required)
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00 (12 credits required)
• EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
• EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00 (2 credits required; satisfies BSS for core)
• EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
• EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
• EDPS 26501 - The Inclusive Classroom Credits: 2.00
• EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00 (1 credit required)
• EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00 (2 credits required)
• EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00 (2 credits required)
• EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00 (1 credit required; satisfies BSS for core)
• EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
• EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00

Learner Specialty Pathway Selective (3 credits)

Choose one course from one of the learner specialty pathway areas below. Students can elect to take additional coursework to complete a full concentration if they choose, but is not required. See the links for concentration requirements.

If you desire additional information regarding the Learner Specialty Pathway Concentrations, please reach out to your academic advisor or visit the Learner Specialty Concentrations tab found here.

**English Language Learners**
• EDCI 51900 - Teaching English Language Learners Credits: 3.00
• EDCI 52600 - Language Study For Educators Credits: 3.00
  **High Ability** - All courses must be completed with a B- or better average.
• EDPS 54200 - Curriculum And Program Development In Gifted Education Credits: 3.00
• EDCI 54500 - Social And Affective Development Of Gifted Students Credits: 3.00
  **Special Education**
• EDCI 21100 - Special Education Law, Policy, And Ethical Guidelines Credits: 3.00
  **Applied Behavior Analysis**
• EDCI 34100 - Introduction To Philosophical Underpinnings And Concepts Of Applied Behavior Analysis Credits: 3.00
• EDCI 34200 - Applied Behavior Analysis - Assessment And Intervention Credits: 3.00

**Optional Concentration**

K-12 Integrated STEM Optional Concentration for Education

**Other Departmental/Program Course Requirements (9-21 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^- Labeled as a Science Core Selection in the four year plan of study

*- Requirement may be met with a zero credit experiential learning option. See your advisor for more information.
Composition & Presentation

Written Communication

Met with EDCI 20500. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.**
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework (CS 15900, 17600, 17700, 18000).*

Cultural Diversity (Language & Culture)^* (0-6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - Met with EDCI 28500
- Language & Culture Option II
- Language & Culture Option III

General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - met with EDPS 23500
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework (CHM 11500/11600).*

Mathematics
Science Technology and Society

Met with EAPS 20000 in major.

Statistics

Met with required major coursework.

Team-Building and Collaboration

Met with EDCI 49800 in major.

Electives (0-16 credits)

GPA Requirements

- 2.0 Graduation GPA required for Bachelor of Science degree.
- 2.0 average in EAPS major classes required to graduate.
- 2.5 Overall GPA is required for the Teacher Education Program and Indiana Licensure.
- Overall GPA for Earth Space Concentration courses with the Departmental/Program Major Courses must be \( \geq 2.50 \). This includes all courses under the Science Education Core plus all courses in the Earth Space Concentration unless otherwise indicated.

Teacher Licensure Information

Successful completion of the Purdue University Science Education-Earth Space Science Concentration Program, Science Education-Earth Space Science, BS, and the State of Indiana licensure requirements results in an Indiana initial instructional License in Earth Space Science (5-12), and Blended and Online Teaching (5-12). Contact the Office of Teacher Education and Licensure for additional information regarding Teacher Education and licensure requirements.

Office of Teacher Education and Licensure

Teacher Education Program (TEP) Requirements and Milestones

Indiana Licensure information - Each student must meet all degree, program, and licensure requirements prior to being recommended for licensure.

- 2.5 Overall GPA is required for the Teacher Education Program.
- Students must successfully progress through Milestone A to enroll in any Professional Education **Restricted Methods course.
- Successful completion of all Major, Professional Education (including all Foundations Courses with linked Foundations Portfolio Common Assessments and **Restricted Methods Courses), Learner Specialty Concentration/Pathway, and degree courses are required prior to Milestone C. Program limitations restrict additional courses to be taken simultaneously with or following student teaching without advance authorization.
- Successful completion of all Foundations Portfolio Common Assessments are required prior to Milestone D.
- Blended and online Teaching licensure requirements are embedded into coursework for all Undergraduate Licensure Programs.
Beginning July 1, 2025 - According to the Indiana State Board of Education, students seeking an Initial Indiana License in a content area involving literacy instruction, including special education, must obtain an early literacy endorsement, Science of Reading (P-5), as required under IC 20-28-5-19.7.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement
The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

- This degree is intended to give students many options. Students need to consult with a College of Science Academic Advisor regarding requirements.

Sample 4-Year Plan

Fall 1st Year

- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦
- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00 ♦ or
- EAPS 11100 - Physical Geology Credits: 3.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00

16-19 Credits

Spring 1st Year

- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00
- CHM 11600 - General Chemistry Credits: 4.00 ♦ or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 ♦ or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦ or
- CHM 13600 - General Chemistry Honors **Credits:** 4.00 ♦
- EAPS 10900 - The Dynamic Earth **Credits:** 3.00 or
- EAPS 11200 - Earth Through Time **Credits:** 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00

**15-17 Credits**

**Fall 2nd Year**

- EAPS 24300 - Mineralogy **Credits:** 4.00 ♦
- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents **Credits:** 1.00
- EDCI 37001 - Teaching And Learning English As A New Language **Credits:** 2.00 or 3.00
- EDPS 24800 - Differentiating Curriculum And Instruction **Credits:** 1.00
- EDPS 36201 - Positive Behavioral Supports **Credits:** 2.00 or 3.00
- PHYS 17200 - Modern Mechanics **Credits:** 4.00 or
- PHYS 22000 - General Physics **Credits:** 4.00
- Science Core Selection - **Credit Hours:** 3.00

**17 Credits**

**Spring 2nd Year**

- EAPS 20000 - Water World: Processes And Challenges In Global Hydrology **Credits:** 3.00
- EAPS 35400 - Earth And Planetary Geophysics **Credits:** 3.00
- EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches **Credits:** 1.00
- EDPS 23500 - Learning And Motivation **Credits:** 2.00 or 3.00
- EDPS 24000 - Children With Gifts, Creativity, And Talents **Credits:** 1.00
- EDPS 26501 - The Inclusive Classroom **Credits:** 2.00
- PHYS 27200 - Electric And Magnetic Interactions **Credits:** 4.00 or
- PHYS 22100 - General Physics **Credits:** 4.00 or
- PHYS 24100 - Electricity And Optics **Credits:** 3.00 and PHYS 25200 - Electricity And Optics Laboratory

**16 Credits**

**Fall 3rd Year**

- EAPS 10500 - The Planets **Credits:** 3.00
- EAPS 11700 - Introduction To Atmospheric Science **Credits:** 3.00
- EAPS 35300 - Earth And Planetary Surface Processes **Credits:** 3.00
- EDCI 27000 - Introduction To Educational Technology And Computing **Credits:** 1.00 to 3.00
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems **Credits:** 1.00 to 3.00
- Science Core Selection - **Credit Hours:** 3.00
- Elective (if needed) - **Credit Hours:** 3.00
14-17 Credits

Spring 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- EAPS 39000 - Geologic Field Methods Credits: 3.00
- EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
- EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00
- Learner Pathway Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective (if needed) - Credit Hours: 3.00

14-18 Credits

Fall 4th Year

- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
- EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00
- EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- Great Issues Option - Credit Hours: 3.00

16 Credits

Spring 4th Year

- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00

12 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course
The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Science Education - Physics Concentration, BS

About the Science Education Program

A College of Science degree in Science Education prepares future science teachers for certification at the middle and high school level. Students customize their focus by selecting a major area of study in biology, chemistry, physics, or earth and space science within an interdisciplinary science framework. The Science Education degree ensures students are thoroughly educated in their content discipline and modern theories of learning and education. Graduates are in high demand as STEM education and careers continue to grow in demand.

This program meets state and national licensure standards and is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the State of Indiana, State Board of Education. See Teacher Licensure Information in the plan below.

Science Education Major Change (CODO) Requirements

Degree Requirements

124 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses**

**Required Science Education Core Courses (24-30 credits)**

**Required Chemistry Course (4-5 credits)**

*Biology students must take CHM 12901; Chemistry, Earth/Space, and Physics students choose CHM 11500 or CHM 12500. (satisfies Science for core)*

- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

**Required Computing Option (3-4 credits)**
Choose one.

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Required Calculus Selective Courses (6-10 credits)

Choose one sequence available for your concentration. (satisfies Quantitative Reasoning for core)

Option 1 (all concentrations)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00

Option 2 (all concentrations)

- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Option 3 (Biology only)

- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16020 - Applied Calculus II Credits: 3.00

Required Physics Courses (8 credits)

Choose one sequence available for your concentration. (satisfies Science for core)

Option 1 (Biology, Chemistry, Earth/Space)

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00

Option 2 (Physics only)

- PHYS 17200 - Modern Mechanics Credits: 4.00 - HONORS version required
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 - HONORS version required

Option 3 (Biology, Chemistry, Earth/Space)

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Option 4 (Earth/Space only)
PHYS 22000 - General Physics Credits: 4.00
PHYS 22100 - General Physics Credits: 4.00

Option 5 (Biology only)

PHYS 23300 - Physics For Life Sciences I Credits: 4.00
PHYS 23400 - Physics For Life Sciences II Credits: 4.00

Required Statistics Selective Courses (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 (CHEM, ESSE, PHYS; satisfies Information Literacy for core) or
- STAT 35000 - Introduction To Statistics Credits: 3.00 (CHEM) or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 (BIOL)

Professional Education Requirements (43-44 credits)

All required Professional Education, and Learner Specialty Pathway courses are calculated into the 2.5 Overall Teacher Education GPA requirement with no grade lower than a "C".

- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦ (2 credits required; satisfies Written Communication for core)
- EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00 (1 credit required; satisfies Information Literacy for core)
- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦ (2 credits required; satisfies Behavioral/Social Science for core)
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00 (1 credit required)
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00 (1 credit required)
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
- EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00 (12 credits required)
- EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00 (2 credits required; satisfies Behavioral/Social Science for core)
- EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
- EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
- EDPS 26501 - The Inclusive Classroom Credits: 2.00
- EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00 (1 credit required)
- EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00 (2 credits required)
- EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00 (2 credits required)
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00 (1 credit required)
- EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
• EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00

Learner Pathway Selective (3 credits)

Choose one course from one of the learner specialty pathway areas below. Students can elect to take additional coursework to complete a full concentration if they choose, but is not required. See the links for concentration requirements.

If you desire additional information regarding the Learner Specialty Pathway Concentrations, please reach out to your academic advisor or visit the Learner Specialty Concentrations tab found here.

English Language Learners
• EDCI 31950 - Approaches To English Learner Education Credits: 3.00
• EDCI 32650 - Introduction To Linguistics And Language Acquisition In Education Credits: 3.00
  High Ability - All courses must be completed with a B- or better average.
• EDPS 54200 - Curriculum And Program Development In Gifted Education Credits: 3.00
• EDPS 54500 - Social And Affective Development Of Gifted Students Credits: 3.00
  Special Education
• EDPS 21100 - Special Education Law, Policy, And Ethical Guidelines Credits: 3.00
  Applied Behavior Analysis
• EDPS 34100 - Introduction To Philosophical Underpinnings And Concepts Of Applied Behavior Analysis Credits: 3.00
• EDPS 34200 - Applied Behavior Analysis - Assessment And Intervention Credits: 3.00

Physics Concentration (36-38 credits)

Overall GPA for Physics Concentration courses with the Departmental/Program Major Courses must be ≥ 2.5

Required courses for the Physics Concentration that are met within Department/Program requirements, but included in the content GPA for this concentration:
• CHM 11500/12500/12300
• PHYS 17200/17200H (note: Majors in Physics must take the Honors Versions)
• PHYS 27200/27200H (note: Majors in Physics must take the Honors Versions)
• PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
• PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
• PHYS 31000 - Intermediate Mechanics Credits: 4.00
• PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
• PHYS 34000 - Modern Physics Laboratory Credits: 1.00
• PHYS 34400 - Introduction To Quantum Science Credits: 4.00
• PHYS 36000 - Quantum Mechanics Credits: 3.00
• PHYS 42200 - Waves And Oscillations Credits: 3.00
• PHYS 45000 - Intermediate Laboratory Credits: 2.00
• CHM 11600 - General Chemistry Credits: 4.00 ♦ (satisfies Science for core) or
• CHM 12600 - Introduction To Chemistry II Credits: 5.00 ♦ (satisfies Science for core) or
• CHM 13600 - General Chemistry Honors Credits: 4.00 ♦

PHYS Major Selectives (6-7 credits)

• PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
- PHYS 58000 - Computational Physics **Credits:** 3.00
- PHYS/ASTR ≥ 300 level - Credit Hours: 3.00
- Science/Engineering ≥ 300 level (met with STAT 30100)
- Science/Engineering ≥ 300 level (met with Great Issues Option)

**Optional Concentration**

K-12 Integrated STEM Optional Concentration for Education

**Other Departmental /Program Course Requirements (13-26 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**Written Communication**

Met with EDCI 20500 (satisfies Written Communication and Information Literacy for core).

**Technical Writing And Presentation**^* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#) (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

**Cultural Diversity (Language & Culture)^* (0-6 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - Met with EDCI 28500
- Language & Culture Option II
- Language & Culture Option III
General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - met with EDPS 23500
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework.*

Mathematics

*Met with required major coursework.*

Science Technology & Society

*Met with EDCI 42400 in major.*

Statistics

*Met with required major coursework.*

Team-Building and Collaboration

*Met with EDCI 49800 in major.*

Required Pre-Requisite Course (4-5 Credits)

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Electives (0-8 credits)

GPA Requirements

- Overall GPA for Physics Concentration courses with the Departmental/Program Major Courses must be ≥ 2.5
  - Required courses for the Physics Concentration that are met within Department/Program requirements, but included in the content GPA for this concentration:
    - CHM 11500/12500/12300
    - PHYS 17200/17200H (note: Majors in Physics must take the Honors Versions)
- PHYS 27200/27200H (note: Majors in Physics must take the Honors Versions)
  - 2.5 average in Physics concentration courses required to graduate
  - 2.0 Graduation GPA for a Bachelor of Science degree.
  - 2.5 Overall GPA is required for the Teacher Education Program.

**Teacher Licensure Information**

Successful completion of the Purdue University Science Education-Physics Concentration Program, Science Education-Physics, BS, and the State of Indiana licensure requirements results in an Indiana initial instructional License in Physics (5-12), and Blended and Online Teaching (5-12). Contact the Office of Teacher Education and Licensure for additional information regarding Teacher Education and licensure requirements.

**Office of Teacher Education and Licensure**

**Teacher Education Program (TEP) Requirements and Milestones**

Indiana Licensure information - Each student must meet all degree, program, and licensure requirements prior to being recommended for licensure.

- 2.5 Overall GPA is required for the Teacher Education Program.
- Students must successfully progress through Milestone A to enroll in any Professional Education **Restricted Methods course.
- Successful completion of all Major, Professional Education (including all Foundations Courses with linked Foundations Portfolio Common Assessments and **Restricted Methods Courses), Learner Specialty Concentration/Pathway, and degree courses are required prior to Milestone C. Program limitations restrict additional courses to be taken simultaneously with or following student teaching without advance authorization.
- Successful completion of all Foundations Portfolio Common Assessments are required prior to Milestone D.
- Blended and online Teaching licensure requirements are embedded into coursework for all Undergraduate Licensure Programs.
- Beginning July 1, 2025 - According to the Indiana State Board of Education, students seeking an Initial Indiana License in a content area involving literacy instruction, including special education, must obtain an early literacy endorsement, Science of Reading (P-5), as required under IC 20-28-5-19.7.

**Course Requirements and Notes**

- College of Science Not Recommended Courses
- Overlapping Course Content courses - Due to the overlapping content, the College does not recommend that students complete multiple courses within the same group.

**College of Science Pass/No Pass Option Policy**

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Additional Information

- This degree is intended to give students many options. Students need to consult with a College of Science Academic Advisor regarding requirements.
- Indiana Licensure Information

Sample 4-Year Plan

Fall 1st Year

- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 (HONORS)
- CHM 11500 - General Chemistry Credits: 4.00 or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- Science Core Selection Language & Culture - Credit Hours: 3.00

17-19 Credits

Spring 1st Year

- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 (HONORS)
- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 or
- CHM 13600 - General Chemistry Honors Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

16-18 Credits

Fall 2nd Year
• EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
• EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00
• EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
• EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00
• PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
• PHYS 34000 - Modern Physics Laboratory Credits: 1.00
• PHYS 34400 - Introduction To Quantum Science Credits: 4.00
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00

18-19 Credits

Spring 2nd Year

• EDCI 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
• EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00
• EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
• EDPS 26501 - The Inclusive Classroom Credits: 2.00
• PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
• PHYS 42200 - Waves And Oscillations Credits: 3.00
• STAT 30100 - Elementary Statistical Methods Credits: 3.00
• Science Core Selection TWTP (COM 21700 strongly recommended) - Credit Hours: 3.00

15 Credits

Fall 3rd Year

• EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00
• EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00
• PHYS 31000 - Intermediate Mechanics Credits: 4.00
• PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
• PHYS 45000 - Intermediate Laboratory Credits: 2.00
• Learner Pathway Selective - Credit Hours: 3.00
• Science Core Selection Language & Culture - Credit Hours: 3.00

17 Credits

Spring 3rd Year

• PHYS 36000 - Quantum Mechanics Credits: 3.00
• CS 15900 - C Programming Credits: 3.00 or
• CS 17600 - Data Engineering In Python Credits: 3.00 or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• EDCI 42800 - Teaching Science In The Middle And Junior High School Credits: 2.00 or
• EDCI 55800 - Integrated Science, Technology, Engineering And Mathematics (STEM) Education Methods-Secondary Credits: 3.00
• PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
• PHYS 58000 - Computational Physics Credits: 3.00
• Science Core Selection General Education - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• EDCI 42400 - The Teaching Of Earth And Physical Science In The Secondary Schools Credits: 3.00
• EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00
• EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00
• PHYS/ASTR ≥ 300 level - Credit Hours: 3.00
• Science Core Selection Great Issues - Credit Hours: 3.00
• Science Core Selection General Education - Credit Hours: 3.00
• Elective - Credit Hours: 2.00

17 Credits

Spring 4th Year

• EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00 - Spring only

12 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Certificate

Applications in Data Science Certificate

About the Certificate

Data science involves the development or application of statistical, mathematical and algorithmic techniques or tools with an aim to extract knowledge from large-scale and/or complex datasets and communicate findings.

The Applications in Data Science Undergraduate Certificate program's learning outcomes will consist of the following:

1. Describe the stages of the data life cycle (data acquisition, organization, curation, analysis, preservation, and communication) and create an effective data management and data analysis plan

2. Develop a foundation in statistical, mathematical and algorithmic techniques or tools for the analysis of large-scale datasets

3. Apply statistical, mathematical and algorithmic techniques or tools in order to extract knowledge and insights from large-scale datasets

4. Interpret results from large-scale data analysis and communicate findings

5. Identify ethical and social implications of data-science-driven decision making and policies and one's own ethical and social responsibilities when working with data

Requirements for the Certificate (16 credits)

Core Courses (10 credits)

Foundation in Statistical Methods (3 credits)

Education

- EDPS 55600 - Introduction To Quantitative Data Analysis Methods In Education I Credits: 3.00
- EDPS 55700 - Introduction To Quantitative Data Analysis Methods In Education II Credits: 3.00
Engineering

- AAE 36100 - Introduction To Random Variables In Engineering Credits: 3.00 *
- CHE 32000 - Statistical Modeling And Quality Enhancement Credits: 3.00
- ECE 20875 - Python For Data Science Credits: 3.00
- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering Credits: 3.00
- IDE 36000 - Multidisciplinary Engineering Statistics Credits: 3.00
- IE 33000 - Probability And Statistics In Engineering II Credits: 3.00

Health and Human Sciences

- PSY 20100 - Introduction To Statistics In Psychology Credits: 3.00

Liberal Arts

- ANTH 30600 - Quantitative Methods For Anthropological Research Credits: 3.00
- COM 30400 - Quantitative Methods For Communication Research Credits: 3.00
- COM 41100 - Communication And Social Networks Credits: 3.00
- POL 30000 - Introduction To Political Analysis Credits: 3.00
- POL 50100 - Political Science: Methodology Credits: 3.00
- SOC 40900 - Social Networks Credits: 3.00

Management

- ECON 26000 - Data Visualization And Inference Credits: 3.00
- ECON 36000 - Econometrics Credits: 3.00
- MGMT 30500 - Business Statistics Credits: 3.00
- MGMT 30600 - Management Science Credits: 3.00

Science

- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 39500 - Special Assignments Credits: 0.00 to 18.00 *
- BIOL 49500 - Special Assignments Credits: 0.00 to 18.00 * Data Science: Good Versus Bad
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 59500 - Special Assignments Credits: 0.00 to 18.00 *
- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00
- PHYS 49000 - Special Assignments Credits: 1.00 to 3.00 * Data Science: Good Versus Bad
- STAT 22500 - Introduction To Probability Models Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 30301 - Probability And Statistics For Business Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 35500 - Statistics For Data Science Credits: 3.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 * Data Science: Good Versus Bad
- STAT 50100 - Experimental Statistics I Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00

Foundation in Computation (3 credits)

Agriculture

- ABE 20500 - Computations For Engineering Systems Credits: 3.00
- ABE 30100 - Modeling And Computational Tools In Biological Engineering Credits: 3.00
- AGEC 20201 - Introduction To Data Analytics For Agricultural Business Credits: 3.00
- ASM 10500 - Computing Technology With Applications Credits: 3.00

Engineering

- ECE 20875 - Python For Data Science Credits: 3.00
• ECE 26400 - Advanced C Programming Credits: 3.00
• ECE 36800 - Data Structures Credits: 3.00
• ECE 46900 - Operating Systems Engineering Credits: 4.00
• ECE 47300 - Introduction To Artificial Intelligence Credits: 3.00
• IE 33200 - Computing In Industrial Engineering Credits: 3.00

Management
• ECON 37300 - Computational Economics Credits: 3.00
• MGMT 28800 - Programming For Business Applications Credits: 3.00

Polytechnic
• CNIT 10500 - Introduction To C Programming Credits: 3.00
• CNIT 13600 - Personal Computing Technology And Applications Credits: 3.00
• CNIT 17600 - Information Technology Architectures Credits: 3.00

Science
• BIOL 59500 - Special Assignments Credits: 0.00 to 18.00 * Building the Tree of Life
• CE 50701 - Geospatial Data Analytics Credits: 3.00
• CS 10100 - Digital Literacy Credits: 3.00
• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• CS 19000 - Topics In Computer Sciences Credits: 1.00 to 5.00 * Data Engineering in Python
• CS 23500 - Introduction To Organizational Computing Credits: 3.00
• EAPS 50701 - Geospatial Data Analytics Credits: 3.00
• MA 16290 - Data Science Labs: Calculus Credits: 1.00

Foundation in Data Literacy, Management, and Analytics (3 credits)

Agriculture
• AGEC 20201 - Introduction To Data Analytics For Agricultural Business Credits: 3.00
• AGRY 42000 - Computing For The Natural Sciences Credits: 3.00
• ASM 53200 - Introduction To Agricultural Informatics Credits: 3.00
• BCHM 42100 - R For Molecular Biosciences Credits: 3.00
• ENTM 24200 - Data Science Credits: 3.00

Data Mine (Requires three 1-credit seminars listed below to complete the requirement.)
• TDM 10100 - The Data Mine Seminar I Credits: 1.00 (formerly offered as STAT 19000 - Tpcs In Stat For UG * The Data Mine I)
• TDM 10200 - The Data Mine Seminar II Credits: 1.00 (formerly offered as STAT 19000 - Tpcs In Stat For UG * The Data Mine II)
• TDM 20100 - The Data Mine Seminar III Credits: 1.00 (formerly offered as STAT 29000 - Tpcs In Stat For UG * The Data Mine III)
• TDM 20200 - The Data Mine Seminar IV Credits: 1.00 (formerly offered as STAT 29000 - Tpcs In Stat For UG * The Data Mine IV)
• TDM 30100 - The Data Mine Seminar V Credits: 1.00 (formerly offered as STAT 39000 - Tpcs In Stat For UG * The Data Mine V)
• TDM 30200 - The Data Mine Seminar VI Credits: 1.00 (formerly offered as STAT 39000 - Tpcs In Stat For UG * The Data Mine VI)
• TDM 40100 - The Data Mine Seminar VII Credits: 1.00 (formerly offered as STAT 49000 - Tpcs In Stat For UG * The Data Mine VII)
- **TDM 40200 - The Data Mine Seminar VIII** Credits: 1.00 *(formerly offered as STAT 49000 - Tpcs In Stat For UG *)

**Engineering**
- ECE 20875 - Python For Data Science Credits: 3.00
- ECE 29595 - Selected Topics In Electrical And Computer Engineering Credits: 1.00 to 5.00 *(Introduction to Data Science)*
- ECE 30010 - Introduction To Machine Learning And Pattern Recognition Credits: 3.00
- ECE 47300 - Introduction To Artificial Intelligence Credits: 3.00

**Honors**
- HONR 39500 - Interdisciplinary Honors - Independent Study Credits: 1.00 to 3.00 *(Well-Being Scholar Development)*

**Information Studies**
- ILS 25000 - Introduction To Geographic Information Systems Credits: 3.00
- ILS 59500 - Special Topics In Information And Data Science Credits: 1.00 to 4.00 *(Data Management and Curation for Qualitative Researchers *)

**Management**
- ECON 26000 - Data Visualization And Inference Credits: 3.00
- MGMT 38200 - Management Information Systems Credits: 3.00
- MGMT 54400 - Database Management Systems Credits: 3.00

**Polytechnic**
- CNIT 17500 - Visual Programming Credits: 3.00
- CNIT 48800 - Data Warehousing Credits: 3.00
- CNIT 57000 - IT Data Analytics Credits: 3.00

**Science**
- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 49500 - Special Assignments Credits: 0.00 to 18.00 *(Data Science: Good Versus Bad)*
- BIOL 59500 - Special Assignments Credits: 0.00 to 18.00 *
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 19000 - Topics In Computer Sciences Credits: 1.00 to 5.00 *(Data Engineering in Python)*
- CS 24200 - Introduction To Data Science Credits: 3.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00 *(Geospatial Analysis in Earth and Planetary Contexts)*
- MA 16290 - Data Science Labs: Calculus Credits: 1.00
- PHYS 49000 - Special Assignments Credits: 1.00 to 3.00 *(Data Science: Good Versus Bad)*
- STAT 24200 - Introduction To Data Science Credits: 3.00
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 *(Data Science: Good Versus Bad)*
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00

**Foundation in Data Ethics and Digital Citizenship (1-4 credits)**

**Honors**
- HONR 39900 - Interdisciplinary Honors - Special Topics Seminar Credits: 1.00 to 6.00 *(Technological Justice)*
- HONR 49900 - Honors Research Project Credits: 1.00 to 6.00 *(Institutional Data Research)*
Information Studies

- ILS 10300 - Introduction To Data Lifecycle Management Credits: 1.00
- ILS 23000 - Data Science And Society: Ethical Legal Social Issues Credits: 3.00
- ILS 29500 - Special Topics In Information And Data Science Credits: 1.00 to 4.00

Liberal Arts

- PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00
- PHIL 20800 - Ethics Of Data Science Credits: 3.00
- PHIL 29000 - Environmental Ethics Credits: 3.00
- PHIL 29300 - Selected Topics In Philosophy Credits: 1.00 to 3.00
- POL 22800 - Data Science And Public Policy Credits: 3.00
- POL 22900 - Emerging Problems In Political Science Credits: 1.00 to 3.00

Application Focus (6 credits)

Agriculture

- ABE 49800 - Undergraduate Research In Agricultural And Biological Engineering Credits: 1.00 to 3.00
- AGEC 30500 - Agricultural Prices Credits: 3.00
- AGEC 32100 - Principles Of Commodity Marketing Credits: 3.00
- AGEC 35200 - Quantitative Techniques For Firm Decision Making Credits: 3.00
- AGEC 42100 - Advanced Commodity Marketing Credits: 3.00
- AGEC 45100 - Applied Econometrics Credits: 3.00
- AGEC 49800 - Special Problems Credits: 1.00 to 3.00
- AGEC 49900 - Thesis Credits: 1.00 to 6.00
- AGEC 50600 - Agricultural Marketing And Price Analysis Credits: 3.00
- AGEC 51600 - Mathematical Tools For Agricultural And Applied Economics Credits: 3.00
- AGEC 55200 - Introduction To Mathematical Programming Credits: 3.00
- AGR 33300 - Data Science For Agriculture Credits: 3.00
- AGRY 32000 - Genetics Credits: 3.00
- AGRY 39900 - Individual Study Credits: 1.00 to 3.00
- AGRY 44400 - Weather Analysis And Forecasting Credits: 3.00
- AGRY 48500 - Precision Crop Management Credits: 3.00
- AGRY 53000 - Advanced Plant Genetics Credits: 3.00
- AGRY 54500 - Remote Sensing Of Land Resources Credits: 3.00
- AGRY 56500 - Soils And Landscapes Credits: 3.00
- AGRY 59800 - Special Problems Credits: 1.00 to 6.00
- AGRY 60000 - Genomics Credits: 3.00
- ANSC 31100 - Animal Breeding And Genetics Credits: 4.00
- ANSC 51100 - Population Genetics Credits: 3.00
- ASEC 49000 - Special Problems Credits: 1.00 to 6.00
- ASEC 49700 - Thesis Research Credits: 1.00 to 6.00
- ASEC 49900 - Special Problems In Agricultural Communication Credits: 1.00 to 3.00
- ASEC 59000 - Special Problems Credits: 1.00 to 6.00
- ASM 42200 - Advanced Machine Technology For Agricultural Crop Production Credits: 3.00
- ASM 49000 - Special Problems Credits: 1.00 to 6.00 *
- ASM 49500 - Agricultural Systems Management Capstone Project Credits: 3.00 *
- ASM 53200 - Introduction To Agricultural Informatics Credits: 3.00
- ASM 54000 - Geographic Information System Application Credits: 3.00
- BCHM 49800 - Research In Biochemistry Credits: 1.00 to 6.00 *
- BCHM 49801 - Head Start To Biochemistry Research Credits: 0.50 to 2.00 *
- BCHM 52100 - Comparative Genomics Credits: 3.00
- BTNY 30200 - Plant Ecology Credits: 3.00
- BTNY 49800 - Research In Plant Science Credits: 1.00 to 3.00 *
- BTNY 53500 - Plant Disease Epidemiology Credits: 3.00
- ENTM 30100 - Experimentation And Analysis Credits: 3.00
- ENTM 41000 - Applied Insect Biology Credits: 2.00
- ENTM 41001 - Insects Of Urban Landscapes Credits: 1.00
- ENTM 41002 - Insects Of Agricultural Crops Credits: 1.00
- ENTM 49310 - Insect Biology Capstone Experience Credits: 2.00 or 4.00 *
- ENTM 49700 - Special Problems In Forensic Science Credits: 1.00 to 4.00 *
- ENTM 49800 - Special Problems In Entomology Credits: 1.00 to 4.00 *
- FNR 21000 - Natural Resource Information Management Credits: 3.00
- FNR 34800 - Wildlife Investigational Techniques Credits: 3.00
- FNR 35100 - Aquatic Sampling Techniques Credits: 3.00
- FNR 35300 - Natural Resources Measurement Credits: 3.00
- FNR 35500 - Quantitative Methods For Resource Management Credits: 3.00
- FNR 35700 - Fundamental Remote Sensing Credits: 3.00
- FNR 35910 - Spatial Ecology Credits: 2.00
- FNR 35950 - Spatial Ecology Laboratory Credits: 1.00
- FNR 38400 - Statistics For Natural Resources Credits: 3.00
- FNR 49800 - Special Assignments Credits: 1.00 to 3.00 *
- FNR 55800 - Remote Sensing Analysis And Applications Credits: 3.00
- FS 44400 - Statistical Process Control Credits: 1.00
- FS 49100 - Special Assignments In Food Science Credits: 1.00 to 3.00 *
- HORT 49100 - Special Assignments In Horticulture Credits: 1.00 to 3.00 *
- HORT 53000 - Introduction To Computing For Biologists Credits: 3.00
- HORT 53100 - Applied Plant Genomics Credits: 2.00
- HORT 55100 - Plant Responses To The Environment Credits: 3.00
- LA 49000 - Special Problems In Landscape Architecture Credits: 1.00 to 6.00 *
- NRES 49800 - Individual Studies In Environmental Science Credits: 1.00 to 3.00 *
- SFS 39100 - Special Problems In Sustainable Food And Farming Systems Credits: 1.00 to 3.00 *

Data Mine

To fulfill the Application Focus, the courses listed in the Data Mine section must be taken as part of the Data Mine.

- EAPS 19100 - Introductory Topics In Earth And Atmospheric Science Credits: 1.00 to 3.00 * Data Mine: Free and Fair Data * Data Mine: Free and Fair Data II
- MGMT 29000 - Problems In Management Credits: 0.00 to 4.00 * Data Mine Experience I * Data Mine Experience II
• PHYS 39000 - Special Assignments **Credits**: 1.00 to 4.00 * Physics Data Mine * Data Mine Dark Matter * Data Mine High Energy Physics

• TDM 11100 - Corporate Partners I **Credits**: 3.00 *(formerly offered as STAT 19000 - Tpcs In Stat For UG * Data Mine Corporate Partners I)*

• TDM 11200 - Corporate Partners II **Credits**: 3.00 *(formerly offered as STAT 19000 - Tpcs In Stat For UG * Data Mine Corporate Partners II)*

• TDM 21100 - Corporate Partners III **Credits**: 3.00 *(formerly offered as STAT 29000 - Tpcs In Stat For UG * Data Mine Corporate Partners III)*

• TDM 21200 - Corporate Partners IV **Credits**: 3.00 *(formerly offered as STAT 29000 - Tpcs In Stat For UG * Data Mine Corporate Partners IV)*

• TDM 31100 - Corporate Partners V **Credits**: 3.00 *(formerly offered as STAT 39000 - Tpcs In Stat For UG * Data Mine Corporate Partners V)*

• TDM 31200 - Corporate Partners VI **Credits**: 3.00 *(formerly offered as STAT 39000 - Tpcs In Stat For UG * Data Mine Corporate Partners VI)*

• TDM 41100 - Corporate Partners VII **Credits**: 3.00 *(formerly offered as STAT 49000 - Tpcs In Stat For UG * Data Mine Corporate Partners VII)*

• TDM 41200 - Corporate Partners VIII **Credits**: 3.00 *(formerly offered as STAT 49000 - Tpcs In Stat For UG * Data Mine Corporate Partners VIII)*

• TDM 51100 - Corporate Partners **Credits**: 3.00

**Education**

- EDCI 52800 - Human Performance Technology **Credits**: 3.00
- EDCI 55700 - Assessment Of Culturally And Linguistically Diverse Students **Credits**: 3.00
- EDCI 56400 - Integration And Management Of Technology For Learning **Credits**: 3.00
- EDCI 57700 - Strategic Assessment And Evaluation **Credits**: 3.00
- EDPS 32700 - Classroom Assessment **Credits**: 1.00 to 3.00
- EDPS 53100 - Introduction To Measurement And Instrument Design **Credits**: 3.00
- EDPS 53300 - Introduction To Educational Research I: Methodology **Credits**: 3.00
- EDPS 53400 - Introduction To Educational Research II: Measurement Consideration **Credits**: 3.00

**Engineering**

- ABE 31400 - Design Of Electronic Systems **Credits**: 3.00
- ABE 45000 - Computational Modeling And Data Analysis In Agricultural Engineering **Credits**: 3.00
- ABE 46000 - Sensors And Process Control **Credits**: 3.00
- ABE 52700 - Computer Models In Environmental And Natural Resources Engineering **Credits**: 3.00
- ABE 53100 - Instrumentation And Data Acquisition **Credits**: 3.00
- ABE 59100 - Special Topics **Credits**: 0.00 to 4.00 *
- BME 40100 - Mathematical & Computational Analysis Of Complex System Dynamics In Biology, Medicine, & Healthcare **Credits**: 3.00
- CE 40800 - Geographic Information Systems In Engineering **Credits**: 3.00
- CE 50801 - Geographic Information Systems **Credits**: 3.00
- CHE 45000 - Design And Analysis Of Processing Systems **Credits**: 4.00
- ECE 30834 - Fundamentals Of Computer Graphics **Credits**: 3.00
- ECE 43800 - Digital Signal Processing With Applications **Credits**: 4.00
- ECE 44000 - Transmission Of Information **Credits**: 4.00
- ECE 47300 - Introduction To Artificial Intelligence **Credits**: 3.00
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECE 57700</td>
<td>Engineering Aspects Of Remote Sensing</td>
<td>3.00</td>
</tr>
<tr>
<td>EEE 25000</td>
<td>Environmental, Ecological, and Engineering Systems</td>
<td>3.00</td>
</tr>
<tr>
<td>EEE 30000</td>
<td>Environmental And Ecological Systems Modeling</td>
<td>3.00</td>
</tr>
<tr>
<td>IE 33500</td>
<td>Operations Research - Optimization</td>
<td>3.00</td>
</tr>
<tr>
<td>IE 33600</td>
<td>Operations Research - Stochastic Models</td>
<td>3.00</td>
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<tr>
<td>IE 59000</td>
<td>Topics In Industrial Engineering</td>
<td>1.00 to 6.00 *</td>
</tr>
<tr>
<td>ME 36500</td>
<td>Measurement And Control Systems I</td>
<td>3.00</td>
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<tr>
<td>ME 37500</td>
<td>Measurement And Control Systems II</td>
<td>3.00</td>
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<tr>
<td>NUCL 59700</td>
<td>Selected Topics In Nuclear Engineering I</td>
<td>1.00 to 3.00 *</td>
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<tr>
<td>VIP 37920</td>
<td>Junior Participation In Vertically Integrated Projects (VIP)</td>
<td>2.00 (formerly offered as ENGR 37920 Junior Participation In Vertically Integrated Projects)**</td>
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<tr>
<td>VIP 47920</td>
<td>Senior Participation In Vertically Integrated Projects (VIP)</td>
<td>2.00 (formerly offered as ENGR 47920 Senior Participation In Vertically Integrated Projects)**</td>
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<tr>
<td>VIP 47921</td>
<td>Senior Design Participation In Vertically Integrated Projects (VIP) I</td>
<td>2.00 (formerly offered as ENGR 47921 Senior Design Participation I In Vertically Integrated Projects)**</td>
</tr>
<tr>
<td>VIP 47922</td>
<td>Senior Design Participation In Vertically Integrated Projects (VIP) II</td>
<td>2.00 (formerly offered as ENGR 47922 Senior Design Participation II In Vertically Integrated Projects)**</td>
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**Health and Human Sciences**

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<th>Course Title</th>
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<tbody>
<tr>
<td>HTM 50200</td>
<td>Management Information Systems For The Hospitality Industry</td>
<td>3.00</td>
</tr>
<tr>
<td>PSY 30500</td>
<td>Understanding And Analyzing Psychological Data</td>
<td>3.00</td>
</tr>
<tr>
<td>PSY 39800</td>
<td>Independent Research In Psychology</td>
<td>3.00 *</td>
</tr>
<tr>
<td>PSY 49800</td>
<td>Senior Research</td>
<td>3.00 *</td>
</tr>
<tr>
<td>PSY 51300</td>
<td>Introduction To Computational Cognitive Neuroscience</td>
<td>3.00</td>
</tr>
<tr>
<td>PSY 51400</td>
<td>Introduction To Mathematical Psychology</td>
<td>3.00</td>
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<tr>
<td>PUBH 40500</td>
<td>Principles Of Epidemiology</td>
<td>3.00</td>
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<tr>
<td>PUBH 60100</td>
<td>Introduction To The Quantitative Methods Of Public Health</td>
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**Information Studies**

<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ILS 59500</td>
<td>Special Topics In Information And Data Science</td>
<td>1.00 to 4.00 * Geospatial Programming and Data Science</td>
</tr>
</tbody>
</table>

**Liberal Arts**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANTH 52300</td>
<td>GIS For Humanities And Social Science Research</td>
<td>3.00</td>
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<tr>
<td>ENGL 28000</td>
<td>Games, Narrative, Culture</td>
<td>3.00</td>
</tr>
<tr>
<td>PHIL 20800</td>
<td>Ethics Of Data Science</td>
<td>3.00</td>
</tr>
<tr>
<td>PHIL 29000</td>
<td>Environmental Ethics</td>
<td>3.00</td>
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<tr>
<td>PHIL 29300</td>
<td>Selected Topics In Philosophy</td>
<td>1.00 to 3.00 *</td>
</tr>
<tr>
<td>POL 22800</td>
<td>Data Science And Public Policy</td>
<td>3.00</td>
</tr>
<tr>
<td>POL 22900</td>
<td>Emerging Problems In Political Science</td>
<td>1.00 to 3.00 *</td>
</tr>
<tr>
<td>SOC 34000</td>
<td>General Social Psychology</td>
<td>3.00</td>
</tr>
<tr>
<td>SOC 38300</td>
<td>Introduction To Research Methods In Sociology</td>
<td>3.00</td>
</tr>
</tbody>
</table>

**Management**
• ECON 32500 - Economics Of Sports Credits: 3.00
• ECON 36000 - Econometrics Credits: 3.00
• ECON 37300 - Computational Economics Credits: 3.00
• ECON 46300 - Advanced Data Analysis And Machine Learning Credits: 3.00
• ECON 47100 - Behavioral Economics Credits: 3.00
• ECON 48500 - Economics Of Racial And Gender Discrimination Credits: 3.00
• ECON 56200 - Econometrics I Credits: 3.00
• ECON 57300 - Financial Econometrics Credits: 2.00
• ECON 58500 - Behavioral Economics Credits: 2.00 or 3.00
• MGMT 30500 - Business Statistics Credits: 3.00
• MGMT 30600 - Management Science Credits: 3.00
• MGMT 38200 - Management Information Systems Credits: 3.00
• MGMT 40500 - Six Sigma And Quality Analytics Credits: 3.00
• MGMT 42110 - Marketing Analytics Credits: 3.00
• MGMT 46300 - Supply Chain Analytics Credits: 3.00
• MGMT 47200 - Advanced Spreadsheet Modeling And Simulation Credits: 3.00
• MGMT 47300 - Data Mining Credits: 3.00
• MGMT 47400 - Predictive Analytics Credits: 3.00
• MGMT 47900 - Data Visualization Credits: 2.00 or 3.00
• MGMT 48800 - Data-Driven Decisions In Digital Markets Credits: 3.00
• MGMT 52500 - Marketing Analytics Credits: 2.00
• MGMT 54400 - Database Management Systems Credits: 3.00

Polytechnic

• AT 31900 - Uncrewed Aircraft Systems: Applications, Data, And Documentation Credits: 3.00
• CGT 27000 - Introduction To Data Visualization Credits: 3.00
• CGT 27001 - Topics In Data Visualization Credits: 1.00
• CGT 27500 - Data Visualization II Credits: 3.00
• CGT 35600 - Web Programming, Development And Data Integration Credits: 3.00
• CGT 37000 - Interactive Data Visualization Credits: 3.00
• CGT 37700 - Scientific Visualization Credits: 3.00
• CGT 45600 - Advanced Web Programming, Development And Data Integration Credits: 3.00
• CGT 47000 - Data Visualization Studio Credits: 3.00
• CGT 51200 - Foundational Readings Of User Experience Design Credits: 3.00
• CGT 52000 - Computer Graphics Programming Credits: 3.00
• CGT 52100 - Advanced Real-Time Computer Graphics Credits: 3.00
• CGT 58100 - Workshop In Computer Graphics Technology Credits: 0.00 to 8.00 *
• CGT 67000 - Applications In Visual Analytics Credits: 3.00
• CNIT 37200 - Database Programming Credits: 3.00
• CNIT 39200 - Enterprise Data Management Credits: 3.00
• CNIT 48101 - Topics In Computer Information Technology IV Credits: 3.00 *
• CNIT 48200 - Six Sigma Data Quality For Continuous Improvement Credits: 3.00
• CNIT 48700 - Database Administration Credits: 3.00
• CNIT 55900 - Data Warehousing Credits: 3.00
• CNIT 57000 - IT Data Analytics Credits: 3.00
• CNIT 58100 - Workshop In Computer Technology Credits: 0.00 to 8.00 *
• CNIT 62300 - Contemporary Computer Technology Problems Credits: 1.00 to 8.00
• ECET 32700 - Instrumentation And Data Acquisition Design Credits: 3.00
• ECET 35901 - Computer Based Data Acquisition Applications Credits: 3.00
• IET 41300 - Problem-Solving With Automatic Data Collection Credits: 1.00 to 3.00
• TECH 53300 - Design Theory And Technology Credits: 3.00

Science

• BCHM 42200 - Computational Genomics Credits: 3.00
• BCHM 52100 - Comparative Genomics Credits: 3.00
• BIOL 29400 - Biology Research Credits: 1.00 to 4.00 *
• BIOL 31200 - Great Issues Genomics And Society Credits: 3.00
• BIOL 44207 - Exploration Of Protein Structure Credits: 1.00
• BIOL 44400 - Human Medical Genetics Credits: 3.00
• BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
• BIOL 49400 - Biology Research Credits: 1.00 to 4.00 *
• BIOL 49500 - Special Assignments Credits: 0.00 to 18.00 * Biodiversity and Museum Research * Data Science for Biologists
• BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00 *
• BIOL 56310 - Protein Bioinformatics Credits: 3.00
• BIOL 58210 - Ecological Statistics Credits: 3.00
• BIOL 61100 - Crystallography Of Macromolecules Credits: 3.00
• CS 30700 - Software Engineering I Credits: 3.00
• CS 34800 - Information Systems Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00
• CS 47300 - Web Information Search And Management Credits: 3.00
• CE 50701 - Geospatial Data Analytics Credits: 3.00
• EAPS 22700 - Introduction To Atmospheric Observation And Measurements Credits: 3.00
• EAPS 30900 - Computer-Aided Analysis For Geosciences Credits: 3.00
• EAPS 42000 - Global Change Modeling Credits: 3.00
• EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data Credits: 3.00
• EAPS 50701 - Geospatial Data Analytics Credits: 3.00
• EAPS 50801 - Geographic Information Systems Credits: 3.00
• EAPS 50900 - Data Analysis Techniques In Earth And Atmospheric Sciences Credits: 3.00
• EAPS 51000 - Climate Time Series Analysis Credits: 3.00
• EAPS 52300 - Radar Meteorology Credits: 3.00
• EAPS 53000 - Extreme Weather And Climate: Science And Risk Credits: 3.00
• EAPS 54000 - Introduction To Geodesy Credits: 3.00
• EAPS 54100 - Geodetic Data And Applications Credits: 3.00
• EAPS 55700 - Introduction To Seismology Credits: 3.00
• EAPS 55900 - Topics In Seismology Credits: 1.00 to 3.00 *
• EAPS 57700 - Remote Sensing Of The Planets Credits: 3.00
• EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00 *
• MA 16290 - Data Science Labs: Calculus Credits: 1.00
• PHYS 32300 - Research With Big Data I Credits: 3.00
• PHYS 32400 - Research In Big Data II Credits: 3.00
• PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
• STAT 47401 - Statistics For Risk Modeling | Credits: 3.00
• STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 * Statistical Risk Modeling

Notes

• * - Course requires approval before it can be used for this certificate (special topics, special assignments, research, etc). For a list of course titles already approved, click here.
• ** - Project must be approved by the College Representative on the Applications In Data Science Curriculum Committee.
• Each course can only be used once toward certificate completion; cannot count toward multiple areas.
• A minimum of 6 credits must be in coursework outside the student's major requirements.
• A grade of C- or better must be earned in any course used to fulfill the certificate. Students may also use a Pass (P) in any course used to fulfill the certificate.
• Students with a Data Science major are not permitted to receive the Applications In Data Science Certificate.
• Transfer credit brought in as an equivalent course is allowed to apply to the certificate requirements; undistributed transfer credit cannot be applied.

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Learning Beyond the Classroom Certificate

Requirements for the Certificate

Completing the LBC certificate requires that you:

1. Accumulate a total of 24 points, with at least 4 points in each of 3 categories.
2. 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, an entrepreneurial activity together with the certificate of Entrepreneurship and Innovation, and academic year resident assistant. Such an activity is worth 10 points.
3. 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.
4. 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 intensive 10-point activity described above.

Courses
Among the requirements of the Learning Beyond the Classroom Certificate Program is that you participate in either (a) approved coursework with grades of P (pass) or C- or higher (one or more courses totaling 3 credits meets this requirement) or (b) semester-long study abroad or the equivalent.

Below you will find a table of courses that have been identified as meeting the objectives of this program. If there is an experiential course which is not here that you believe to be similar to those listed, contact the administrator. The College of Science Office of Undergraduate Education reserves the right to determine whether a course meets the program criteria.

- AGR 49000 - Special Problems Credits: 0.00 to 3.00
  * International Development Strategies
- BIOL 11500 - Biology Resource Seminar Credits: 1.00
- BIOL 19700 - Biology Freshman Honors Seminar Credits: 1.00
- BIOL 29300 - Sophomore Seminar: Planning Your Future In Biology Credits: 1.00
- BIOL 29400 - Biology Research Credits: 1.00 to 4.00
- BIOL 29500 - Special Assignments Credits: 0.00 to 18.00
  * Teaching Biology
- BIOL 39300 - Preparing For Your Future In Biology Credits: 1.00
- BIOL 49400 - Biology Research Credits: 1.00 to 4.00
- BIOL 49700 - Biology Honors Seminar Credits: 1.00
- BIOL 49800 - Biology Teaching Credits: 3.00
- BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00
- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 19700 - Chemistry Freshman Honors Research Credits: 1.00
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00
- CS 19100 - Freshman Resources Seminar Credits: 1.00
- CS 19700 - Freshman Honors Seminar Credits: 1.00
- CS 29100 - Sophomore Development Seminar Credits: 1.00
- CS 39000 - Topics In Computer Sciences Credits: 1.00 to 5.00
- CS 39100 - Junior Resources Seminar Credits: 1.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00
  * Indiv Study or Part-time Prof Experience CS
- CS 49700 - Honors Research Project Credits: 3.00
- EAPS 10900 - The Dynamic Earth Credits: 3.00
- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00
- EAPS 19100 - Introductory Topics In Earth And Atmospheric Science Credits: 1.00 to 3.00
  * Service Learning in Outreach
- EAPS 35200 - Structural Geology Credits: 3.00
- EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
- EAPS 39000 - Geologic Field Methods Credits: 3.00
- EAPS 39100 - Topics In Earth And Atmospheric Sciences Credits: 1.00 to 4.00
  * Team Weather Forecasting or Meteorology Intern
- EAPS 41900 - Internship In Environmental Geosciences Credits: 1.00 to 6.00
- EAPS 43400 - Weather Analysis And Forecasting Credits: 3.00
- EAPS 49700 - Earth And Atmospheric Sciences Undergraduate Readings And Research Credits: 1.00 to 6.00
- EAPS 55600 - Planetary Surface Processes Credits: 3.00
- EAPS 59000 - Field Geology North America Credits: 2.00
- ECE 37900 - Junior Participation In Vertically Integrated Projects (VIP) In Electrical And Computer Engineering Credits: 1.00 or 2.00
- ECE 47900 - Senior Participation In Vertically Integrated Projects (VIP) In Electrical And Computer Engineering Credits: 1.00 or 2.00
- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00
- EDCI 49000 - Individual Research And Teaching Experience Credits: 1.00 to 8.00
  - Science Teaching Service Learning
- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00
- ENTM 49800 - Special Problems In Entomology Credits: 1.00 to 4.00
  - Indv Study or Forensic Teaching Assistant
- ENTR 48000 - Entrepreneurial Leadership And Careers Credits: 3.00
- EPCS 10100 - First Year Participation In EPICS Credits: 1.00
- EPCS 10200 - First Year Participation In EPICS Credits: 2.00
- EPCS 20100 - Sophomore Participation In EPICS Credits: 1.00
- EPCS 20200 - Sophomore Participation In EPICS Credits: 2.00
- GS 19501 - Preparing For Your Undergraduate Research Experience Credits: 1.00
- GS 29501 - Understanding Your Undergraduate Research Experience I Credits: 1.00
- GS 39501 - Understanding Your Undergraduate Research Experience II Credits: 1.00
- GS 49000 - Directed Reading In General Studies Credits: 1.00 to 4.00
  - Purdue Promise Facilitation Course or Discovery Park Undergr Res
- MA 10800 - Mathematics As A Profession And A Discipline Credits: 1.00
- MA 17000 - Introduction To Actuarial Science Credits: 2.00
- MA 48400 - Seminar On Teaching College Algebra And Trigonometry Credits: 3.00
- MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00
- MCMP 49000 - Special Topics Credits: 1.00 to 3.00
  - Indv Study or TA for PHSC 20400/PHSC 20500 lab
- PHYS 10400 - First Year Physics Seminar Credits: 1.00
- PHYS 23500 - Seminar In Careers In Physics Credits: 1.00
- PHYS 32300 - Research With Big Data I Credits: 3.00
- PHYS 32400 - Research In Big Data II Credits: 3.00
- PHYS 39000 - Special Assignments Credits: 1.00 to 4.00
  - Title: Research with Big Data I - 3.00 credits
- PHYS 49000 - Special Assignments Credits: 1.00 to 3.00
- PHYS 59000 - Reading And Research Credits: 1.00 to 3.00
- PHYS 59300 - Independent Research Credits: 1.00 to 4.00
- PSY 39000 - Research Experience In Psychology Credits: 1.00 to 3.00
- SCI 10000 - Multicultural Leadership Seminar Credits: 1.00
- SCI 19500 - Special Topics In Science Credits: 0.00 to 3.00
  - Global Science Leadership Seminar • Women in Science Program
- SCI 39500 - Special Topics In Science Credits: 0.00 to 3.00
  - Global Science Experience
- SCI 49000 - Topics In Science For Undergraduates Credits: 1.00 to 5.00
  - Dean's Leadership Forum
- STAT 17000 - Introduction To Actuarial Science Credits: 2.00
- STAT 19000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00
  - First Year Statistics Seminar
- STAT 29000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00
- TDM 10100 - The Data Mine Seminar I Credits: 1.00
- TDM 10200 - The Data Mine Seminar II Credits: 1.00
- TDM 11100 - Corporate Partners I Credits: 3.00
- TDM 11200 - Corporate Partners II Credits: 3.00
- TDM 21100 - Corporate Partners III Credits: 3.00
- TDM 21200 - Corporate Partners IV Credits: 3.00
- TDM 31100 - Corporate Partners V Credits: 3.00
- TDM 31200 - Corporate Partners VI Credits: 3.00
- TDM 41100 - Corporate Partners VII Credits: 3.00
- TDM 41200 - Corporate Partners VIII Credits: 3.00
- TDM 51100 - Corporate Partners Credits: 3.00
- VIP 17910 - First-Year Participation In Vertically Integrated Projects (VIP) Lim Credits: 1.00
- VIP 17911 - First Year Participation In Vertically Integrated Projects (VIP) I Credits: 1.00
- VIP 17912 - First Year Participation In Vertically Integrated Projects (VIP) II Credits: 1.00
- VIP 17920 - First Year Participation In Vertically Integrated Projects (VIP) Credits: 2.00
- VIP 27910 - Sophomore Participation In Vertically Integrated Projects (VIP) Lim Credits: 1.00
- VIP 27920 - Sophomore Participation In Vertically Integrated Projects (VIP) Credits: 2.00
- VIP 27930 - Sophomore Participation In Vertically Integrated Projects (VIP) Ext Credits: 3.00
- VIP 37910 - Junior Participation In Vertically Integrated Projects (VIP) Lim Credits: 1.00
- VIP 37920 - Junior Participation In Vertically Integrated Projects (VIP) Credits: 2.00
- VIP 37930 - Junior Participation In Vertically Integrated Projects (VIP) Ext Credits: 3.00
- VIP 47910 - Senior Participation In Vertically Integrated Projects (VIP) Lim Credits: 1.00
- VIP 47920 - Senior Participation In Vertically Integrated Projects (VIP) Credits: 2.00
- VIP 47921 - Senior Design Participation In Vertically Integrated Projects (VIP) I Credits: 2.00
- VIP 47922 - Senior Design Participation In Vertically Integrated Projects (VIP) II Credits: 2.00
- VIP 47930 - Senior Participation In Vertically Integrated Projects (VIP) Ext Credits: 3.00

Notes

- Students who are enrolling in EDCI 49800 or ENTR 48000 during their final semester and wish to receive points toward LBC should alert LBC of their plans at the beginning of the semester.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

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Non-Degree

College of Science Core: Composition and Presentation

Curricular Outcome: Ability to communicate well, both orally and in writing. Students will develop college-level writing and presentation skills through the Technical Writing and Technical Presentation requirement.

Written Communication

- Any course that meets the University Core Written Communication (WC) requirement.

Technical Writing & Presenting (TWTP)

Students may elect to take one course to meet the TWTP requirement or a combination of courses. The list of approved courses below contains all course options. Students may also elect to use experiences as defined below to complete this important Science core requirement.

Technical Writing

The Technical Writing requirement may be met by completing one of the following options:

International Students Only: International students whose primary high school/equivalent instruction was not in English must meet the Technical Writing requirement using option 1 only.

Option 1

A course in technical writing from the list of approved courses below.

- ENGL 30400 - Advanced Composition Credits: 3.00
- ENGL 30900 - Digital Design And Production Credits: 3.00
- ENGL 41900 - Multimedia Writing Credits: 3.00
- ENGL 42000 - Business Writing Credits: 3.00
- ENGL 42100 - Technical Writing Credits: 3.00
- ENGL 42201 - Writing For The Health And Human Sciences Credits: 3.00
- ENGL 42400 - Writing For High Technology Industries Credits: 3.00
- ENGL 43400 - Science And Medical Writing Credits: 3.00
- ENGL 49000 - Worksite Internship Practicum Credits: 1.00 to 3.00 (must be taken for 3 credits)
- MGMT 39100 - Strategic Thinking And Decision-Making Credits: 3.00

Option 2

- Scholarly publication:
  - Paper accepted for publication in a peer-reviewed journal or peer-reviewed conference proceedings in which the student is the lead author or has written the large majority of the paper; or
  - Paper a College of Science faculty member with expertise in the area deems of publishable quality; or
  - Three approved papers of at least 1,500 words each, at least one of which makes a strong or persuasive argument
• Students wishing to meet the Technical Writing requirement through Option 2 are required to complete the Experiential Learning contract process.

Technical Presenting (Oral Communication)

*International Students Only: International students whose primary high school/equivalent instruction was not in English must meet the Technical Presenting requirement using option 1 only.*

Option 1

• Any course that meets the University Core Oral Communication (OC) requirement.

Option 2

• Presentation of scientific work
  - at a scientific meeting (sole or predominant presenter); or
  - at an adjudicated poster session in the presence of a certified judge (written feedback will be required to complete the Experiential Learning Contract process); or
  - during an internship or co-op; or
  - Three approved 10-minute (or longer) presentations within science course(s).

• Students wishing to meet the Technical Presentation requirement through Option 2 are required to complete the Experiential Learning Contract process.

Technical Writing & Presenting

*The following courses meet both Technical Writing & Technical Presenting.*

• COM 21700 - Science Writing And Presentation Credits: 3.00
• CHM 46200 - Intermediate Organic Chemistry Credits: 3.00

Additional Information

• Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

• Earning Core Curricular Requirements through Experience (Option 2)
  - Students may meet The Technical Presentation (Technical Writing) requirement through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

College of Science Core: Computing

*Curricular Outcome: Ability to think and function as a scientist. Students will complement critical thinking and analytical abilities gained within their major area of study by completing an approved computing course. Approved courses are department dependent.*

Computing
• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• ECE 49500 - Selected Topics In Electrical And Computer Engineering Credits: 1.00 to 4.00 - (Intro to Computer Systems - Credit Hours: 3.00)
• ENGR 14200 - Honors Creativity And Innovation In Engineering Design II Credits: 3.50
• ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II Credits: 4.00

Three (3) of the following one (1) credit courses
• MA 29000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00 The Data Science Labs in Multivariate Calculus
• MA 39000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00 The Data Science Labs in Fourier Analysis
• MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 The Data Science Labs in Probability

Any TWO-COURSE combination of the TDM Data Mine Seminar courses.
• TDM 10100 - The Data Mine Seminar I Credits: 1.00
• TDM 10200 - The Data Mine Seminar II Credits: 1.00
• TDM 20100 - The Data Mine Seminar III Credits: 1.00
• TDM 20200 - The Data Mine Seminar IV Credits: 1.00
• TDM 30100 - The Data Mine Seminar V Credits: 1.00
• TDM 30200 - The Data Mine Seminar VI Credits: 1.00
• TDM 40100 - The Data Mine Seminar VII Credits: 1.00
• TDM 40200 - The Data Mine Seminar VIII Credits: 1.00

**College of Science Core: Cultural Diversity (Language and Culture)**

**Curricular Outcome:** Demonstrated breadth of knowledge and cultural appreciation. College of Science students are expected to develop an understanding of at least one other culture in addition to their own through learning a language, taking culture and/or diversity courses, or participating in an approved Study Abroad experience. Satisfaction of this requirement includes completion of a Justice, Equity, Diversity, and Inclusion (JEDI) course.

**Requirement Options**

This nine-credit core requirement is satisfied by the completion of one of the following options:

**Option 1**

Two (2) approved foreign language courses, and one (1) JEDI course from the Culture and Diversity course list.

**Option 2**

One (1) approved foreign language course, one (1) JEDI course from the Culture and Diversity list, and an approved short-term study abroad program (minimum eight (8) days containing a minimum 3-credit course and significant immersion in the local culture). See your Academic Advisor for more information.
Option 3

Three (3) approved courses from the Culture and Diversity list below, containing at least one (1) JEDI course.

- Course selections must enhance a student's understanding and appreciation of other cultures.
- Selections must be made from the approved Culture and Diversity list below.
- Course selections must build upon one another and deepen a student's understanding of a culture or an aspect of multiple cultures.
- Courses may be chosen from different subject matter areas or may be within one subject area. If one subject is chosen, courses must build a student's knowledge of a culture.
- Only one 10000-level course may be used to meet the requirement. A combination of 20000, 30000 and 40000 will be used to complete the requirement.
- A Culture and Diversity Three Course Sequence Approval Form must be submitted to the student's academic advisor explaining the reasoning behind proposed course selections and intended learning outcomes. The advisor will approve the student's course selections or work with the student to develop a plan that meets the intent of the Foreign Language and Culture requirement.

Option 4

An approved study abroad experience* and one (1) JEDI course from the Culture and Diversity list below. Once approved, a non-credit waiver will be applied to a student's degree audit, and six (6) credits are available for elective coursework to meet their 120-credit hour degree requirement. See your Academic Advisor for more information.

An approved program must satisfy the following criteria:

- Take place outside the United States and meet one of the following program requirements:
  - Approved semester or year-long Study Abroad program.
  - Summer program of at least seven and a half weeks duration.
  - Approved short-term study abroad program (not less than 8 days) containing a minimum 3-credit course and significant immersion in the local culture to meet the Culture requirement.
  - Purdue Summer Internship Program
  - College of Education Maymester in Tanzania Study Abroad Program
- Include a minimum three (3) credits of coursework or research
- Include significant immersion in the local culture and language independent of any US-based program in which the student may be participating.

Option 5

International Students. International students meet the intent of the Foreign Language and Culture requirement through their international experience at Purdue University and completion of one (1) JEDI course from the Culture and Diversity list below. A non-credit waiver will be applied to a student's MyPurduePlan audit, and six (6) credits are added to elective coursework to meet the minimum 120-credit hour degree requirement. See your academic advisor for guidelines and approval.

Curriculum Note

Courses which have been taken to meet the Cultural Diversity requirement may not also be used to meet a student's General Education or Great Issues requirement.

*Study Abroad Notes
Approval Process

Students wishing to use an approved study abroad program to meet the Foreign Language and Culture requirement are required to complete the Experiential Learning Contract process.

Scholarships

Study Abroad scholarship opportunities are available.

Language and Culture Electives/Foreign Language Requirement

- ARAB 10100 - Standard Arabic Level I Credits: 3.00
- ARAB 10200 - Standard Arabic Level II Credits: 3.00
- ARAB 20100 - Standard Arabic Level III Credits: 3.00
- ASL 10100 - American Sign Language I Credits: 3.00
- ASL 10200 - American Sign Language II Credits: 3.00
- ASL 20100 - American Sign Language III Credits: 3.00
- CHNS 10100 - Chinese Level I Credits: 4.00
- CHNS 10200 - Chinese Level II Credits: 4.00
- CHNS 20100 - Chinese Level III Credits: 4.00
- FR 10100 - French Level I Credits: 3.00
- FR 10200 - French Level II Credits: 3.00
- FR 20100 - French Level III Credits: 3.00
- GER 10100 - German Level I Credits: 3.00
- GER 10200 - German Level II Credits: 3.00
- GER 20100 - German Level III Credits: 3.00
- HEBR 10100 - Modern Hebrew Level I Credits: 3.00
- HEBR 10200 - Modern Hebrew II Credits: 3.00
- HEBR 20100 - Modern Hebrew Level III Credits: 3.00
- HEBR 12100 - Biblical Hebrew Level I Credits: 3.00
- HEBR 12200 - Biblical Hebrew Level II Credits: 3.00
- HEBR 22100 - Biblical Hebrew Level III Credits: 3.00
- ITAL 10100 - Italian Level I Credits: 3.00
- ITAL 10200 - Italian Level II Credits: 3.00
- ITAL 20100 - Italian Level III Credits: 3.00
- JPNS 10100 - Japanese Level I Credits: 3.00 or 4.00
- JPNS 10200 - Japanese Level II Credits: 0.00 to 4.00
- JPNS 20100 - Japanese Level III Credits: 3.00 or 4.00
- KOR 10100 - Korean Level I Credits: 4.00
- KOR 10200 - Korean Level II Credits: 4.00
- KOR 20100 - Korean Level III Credits: 4.00
- LATN 10100 - Latin Level I Credits: 3.00
- LATN 10200 - Latin Level II Credits: 3.00
- LATN 20100 - Latin Level III Credits: 3.00
- PTGS 10100 - Portuguese Level I Credits: 3.00
- PTGS 10200 - Portuguese Level II Credits: 3.00
- PTGS 20100 - Portuguese Level III Credits: 3.00
### Culture and Diversity Course List

To view which courses on the College of Science Culture and Diversity Course List are designated as JEDI courses, please click here.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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• AGRY 28500 - World Crop Adaptation And Distribution Credits: 3.00
• AGRY 35000 - Global Awareness Credits: 1.00 to 3.00
• AMST 20100 - Interpreting America Credits: 3.00
  African American Pop Culture, Asian American Pop Culture, Intro Asian American Studies, Intro to American Studies: Arab-American Literature, Sports in American Culture
• AMST 10100 - America And The World Credits: 3.00
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• AMST 32000 - Understanding The National Football League Credits: 3.00
• ANSC 33100 - The Role Of Horses In Human History, Culture, And Society Credits: 3.00
• ANSC 38100 - Leadership For A Diverse Workplace Credits: 3.00
• ANTH 10000 - Being Human: Introduction To Anthropology Credits: 3.00
• ANTH 20100 - Introduction To Archaeology And World Prehistory Credits: 3.00
• ANTH 20500 - Human Cultural Diversity Credits: 3.00
• ANTH 21000 - Technology And Culture Credits: 3.00
• ANTH 21200 - Culture, Food And Health Credits: 3.00
• ANTH 23000 - Gender Across Cultures Credits: 3.00
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• ANTH 25600 - Archaeology Of Beer Credits: 3.00
• ANTH 28200 - Introduction To LGBTQ Studies Credits: 3.00
• ANTH 30700 - The Development Of Contemporary Anthropological Theory Credits: 3.00
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• ANTH 31200 - The Archaeology Of Ancient Egypt And The Near East Credits: 3.00
• ANTH 31300 - Archaeology Of North America Credits: 3.00
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• ANTH 34000 - Global Perspectives On Health Credits: 3.00
• ANTH 34100 - Culture And Personality Credits: 3.00
• ANTH 35800 - African Cultures Credits: 3.00
• ANTH 37300 - Anthropology Of Religion Credits: 3.00
• ANTH 37700 - Anthropology Of Hunter-Gatherer Societies Credits: 3.00
• ANTH 37800 - Archaeology And Cultural Anthropology Of Mesoamerica (Mexico, Belize And Guatemala) Credits: 3.00
• ANTH 37900 - Native American Cultures Credits: 3.00
• ANTH 38400 - Designing For People: Anthropological Approaches Credits: 3.00
• ANTH 39200 - Selected Topics In Anthropology Credits: 1.00 to 3.00
  Anthropology and Blackness, Archaeology of Religion and Ritual, Emcees&Jihadis Race & Pop Cult, Race & Religion in the U.S., Race, Religion and Popular Culture in America, The African Amer Experience,&nbsp;Amazonia and Film,&nbsp;Blackness and Culture, Colonial Globalin Food Justice
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• CLCS 18100 - Classical World Civilizations Credits: 3.00
• CLCS 23010 - Survey Of Greek Literature In Translation Credits: 3.00
• CLCS 23100 - Survey Of Latin Literature Credits: 3.00
• CLCS 23300 - Comparative Mythology Credits: 3.00
• CLCS 23500 - Introduction To Classical Mythology Credits: 3.00
• CLCS 23700 - Gender And Sexuality In Greek And Roman Antiquity Credits: 3.00
• CLCS 23800 - The Tragic Vision Credits: 3.00
• CLCS 23900 - The Comic Vision Credits: 3.00
• CLCS 28000 - Topics In Classical Civilization Credits: 3.00
Culture And Society In The Age Of Pericles, Studies in Greek Warfare, Archaeology of Greece
• CLCS 33700 - The Ancient Epic Credits: 3.00
• CLCS 38000 - Alexander The Great And Hellenistic World Credits: 3.00
• CLCS 38100 - Julius Caesar: Statesman, Soldier, Citizen Credits: 3.00
• CLCS 38300 - The Roman Empire Credits: 3.00
• CLCS 38400 - Ancient Western Medicine Credits: 3.00
• CLCS 38500 - Science, Medicine And Magic In The Ancient West Credits: 3.00
• CLCS 38600 - Ancient Greek Religion Credits: 3.00
• CLCS 38700 - Roman Religion Credits: 3.00
• CLCS 48000 - Potters And Society In Antiquity Credits: 3.00
• CLCS 48100 - Culture And Society In The Age Of Pericles Credits: 3.00
• CLCS 48300 - Republican Rome Credits: 3.00
• CLCS 59300 - Special Topics In Classical Literature Credits: 1.00 to 4.00
• CMPL 23000 - Crossing Borders: Introduction To Comparative Literature Credits: 3.00
Arab-American Literature, Arabic Culture, Nature in German Literature, Soviet Literature and Beyond, Women Writers in Translation, North African Lit & Culture, Brit Lit Thru 18 Ct, Israel and the Modern World
• CMPL 26700 - World Literature: From 1700 A D To The Present Credits: 3.00
• CMPL 33000 - International Cinema Credits: 3.00
• CNIT 32000 - Policy, Regulation, And Globalization In Information Technology Credits: 3.00
• COM 10200 - Introduction To Communication Theory Credits: 3.00
• COM 20400 - Critical Perspectives On Communication Credits: 3.00
• COM 22400 - Communicating In The Global Workplace Credits: 3.00
• COM 30301 - Mentored Intercultural Communication Experience Credits: 1.00 to 3.00
• COM 30300 - Intercultural Communication Credits: 3.00
• COM 32800 - Diversity At Work: A Rhetorical Approach Credits: 3.00
• COM 31200 - Rhetoric In The Western World Credits: 3.00
• COM 37600 - Communication And Gender Credits: 3.00
• COM 38100 - Gender And Feminist Studies In Communication Credits: 3.00
• COM 42300 - Leadership, Communication And Organizations Credits: 3.00
• CSR 33200 - Cross-Cultural Marketing And International Retailing Credits: 3.00
• DANC 37800 - Survey Of Concert Dance History Credits: 3.00
• ECON 48500 - Economics Of Racial And Gender Discrimination Credits: 3.00
• EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00
• EDCI 35001 - Tanzania Seminar Credits: 2.00
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- ENGL 39300 - Interdisciplinary Approaches To Environmental And Sustainability Studies Credits: 3.00
- ENGL 39600 - Studies In Literature And Language Credits: 1.00 to 3.00
  Latina/o Of The U S, Maghrebi Literature & Culture, Spirit of Italian Comedy, Theories of Global
- ENGR 39697 - Global Engineering Projects Credits: 1.00 to 3.00
- ENGR 39700 - Global Engineering Experience Credits: 1.00
- ENGL 41200 - Studies In Genre Credits: 3.00
  Black Satire and Humor, Black Speculative Fiction
- ENGL 41400 - Studies In Literature And Culture Credits: 3.00
  Literature and Disability: Deaf & Blind Culture, The Black Male Image, War, Terrorism, Globalization, And The Role
  Of Literature, Witchcraft and Wonder in Early American Literature
- ENGL 43900 - Topics In Disability Studies Credits: 3.00
  Bodies & Cultures,&nbsp;Disability in Fiction & Memoir,&nbsp;Lit in the Age of Eugenics, Disability Literature
- ENGL 46000 - Studies In Women's Literature Credits: 3.00
  Modernist Women Writers, Studies in Women's Literature
- ENGL 46200 - The Bible As Literature: The Old Testament Credits: 3.00
- ENGL 46300 - The Bible As Literature: The New Testament Credits: 3.00
- ENGL 52800 - Medieval English Literature Credits: 3.00
- ENGL 53200 - The English Novel In The Nineteenth Century Credits: 3.00
- ENGL 53800 - English Drama From The Restoration To The Modern Period Credits: 3.00
- ENGL 54700 - British Romanticism Credits: 3.00
- ENGL 54800 - Victorian Literature Credits: 3.00
- ENGL 55700 - Nineteenth-Century African-American Narrative Credits: 3.00
- ENGL 57900 - Modern British Fiction Credits: 3.00
- ENGL 58300 - U S Ethnic/Multicultural Literature Credits: 3.00
  Contemporary African American Fiction
- ENGL 59200 - Postcolonial Studies Credits: 3.00
- ENGL 59600 - Advanced Studies In Literature Or Language Credits: 3.00
  ModEuroRhetoric, Poetics, Narrativity
- ENGT 29900 - Engineering Technology Project Credits: 1.00 to 3.00
- ENTR 47000 - Gender, Diversity And Leadership Credits: 3.00
  La Gastronomie
- FLM 29100 - Special Topics In Film/Video Studies Credits: 1.00 to 4.00
  Women in Film LC
- FLM 33000 - International Cinema Credits: 3.00
- FLM 49100 - Special Topics In Film/Video Studies Credits: 1.00 to 4.00
  Jewish Cinema, Mafia And The Movies, Feminist Prsp on Film & Camera, Post-Soviet Russian Cinema, Engaging
  Religious Diversity
- FNR 30200 - Global Sustainability Issues Credits: 2.00
- FR 10100 - French Level I Credits: 3.00
- FR 10200 - French Level II Credits: 3.00
- FR 10500 - Accelerated Basic French Credits: 4.00
- FR 20100 - French Level III Credits: 3.00
- FR 20500 - Accelerated Intermediate French Credits: 4.00
- FR 22400 - Professional French I Credits: 3.00
- FR 24100 - Introduction To The Study Of French Literature Credits: 3.00
- FR 32400 - Professional French II Credits: 3.00
• FR 33000 - French Cinema Credits: 3.00
• FR 34100 - French Literature I: From The Middle Ages To The Enlightenment Credits: 3.00
• FR 34200 - French Literature II: The 19th And 20th Centuries Credits: 3.00
• FR 38000 - Special Topics In French Culture And Civilization Credits: 3.00
• FR 39400 - Special Topics In French Literature Credits: 3.00

Out of Africa
• FR 40100 - French Level VII Credits: 3.00
• FR 44300 - Introduction To Francophone Literature Credits: 3.00
  Introduction to Francophone Literature, Literature Quebecoise, French Caribbean Literature
• FR 48000 - French Civilization Credits: 3.00
• FR 54100 - Renaissance French Literature Credits: 3.00
• FR 54900 - French Literature And Film Credits: 3.00
• FR 58100 - French Culture Credits: 3.00
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• GER 20500 - Accelerated Intermediate German Credits: 4.00
• GER 22400 - German Level IV: Business German Credits: 3.00
• GER 23000 - German Literature In Translation Credits: 3.00
  German Fairy Tales, German Folk & Fairy Tales, Myths & Legends: Elves to Elvis, Nature and the Environment in German Literature and Thought, Supernatural & Uncanny Ger Lit
• GER 24100 - Introduction To The Study Of German Literature Credits: 3.00
• GER 28000 - German Special Topics Credits: 3.00
  Beer and Brewing in German Culture
• GER 33000 - German Cinema Credits: 3.00
• GER 34100 - German Literature I: From The Middle Ages To The 18th Century Credits: 3.00
• GER 34200 - German Literature II: From The 18th Century To The 21st Century Credits: 3.00
• GER 40100 - German Level VII Credits: 3.00
• GER 42400 - Business German Credits: 3.00
• GER 48000 - German Civilization Credits: 3.00
• GER 49800 - Advanced Topics In German Credits: 3.00 The Cultures of Fascism
• GER 54400 - German Romanticism Credits: 3.00
• GER 54500 - German Prose From Naturalism To The Present Credits: 3.00
• GER 55100 - Lyric Poetry From Romanticism To The Present Credits: 3.00
• GER 55400 - German Drama Before Naturalism Credits: 3.00
• GER 55500 - German Drama From Naturalism To The Present Credits: 3.00
• GER 58100 - German Culture Credits: 3.00
• GER 59400 - Special Topics In German Literature Credits: 1.00 to 4.00
  German Novelle
• GSLA 10100 - Global Awareness Credits: 3.00
• GSLA 30100 - Theories Of Global Studies Credits: 3.00
• GSLA 39100 - Special Topics In Global Studies Credits: 3.00
  Engaging Religious Diversity
• HDFS 20100 - Introduction To Relationship And Family Science Credits: 3.00
• HDFS 21000 - Introduction To Human Development Credits: 3.00
- HDFS 28000 - Diversity In Individual And Family Life Credits: 3.00
- HDFS 31100 - Child Development Credits: 3.00
- HDFS 31300 - Adolescent Development Credits: 3.00
- HDFS 31400 - Atypical Child Development Credits: 3.00
- HDFS 33000 - Sexuality And Family Life Credits: 3.00
- HDFS 33200 - Stress And Coping In Contemporary Families Credits: 3.00
- HDFS 41800 - Understanding Autism Credits: 3.00
- HEBR 10100 - Modern Hebrew Level I Credits: 3.00
- HEBR 10200 - Modern Hebrew II Credits: 3.00
- HEBR 20100 - Modern Hebrew Level III Credits: 3.00
- HEBR 20200 - Modern Hebrew Level IV Credits: 3.00
- HEBR 28400 - Ancient Near Eastern History And Culture Credits: 3.00
- HEBR 38000 - Israel And The Modern World: Cinema, Literature, History And Politics Credits: 3.00
- HEBR 38500 - The Holocaust In Modern Hebrew Literature Credits: 3.00
- HIST 10300 - Introduction To The Medieval World Credits: 3.00
- HIST 10400 - Introduction To The Modern World Credits: 3.00
- HIST 10500 - Survey Of Global History Credits: 3.00
- HIST 20100 - Special Topics In History Credits: 3.00
- HIST 21000 - The Making Of Modern Africa Credits: 3.00
- HIST 21100 - The Global Field: World Soccer And Global History Credits: 3.00
- HIST 22800 - English History To 1688 Credits: 3.00
- HIST 23005 - Hitler's Europe Credits: 3.00
- HIST 23800 - History Of Russia From Medieval Times To 1861 Credits: 3.00
- HIST 24000 - East Asia And Its Historic Tradition Credits: 3.00
- HIST 24100 - East Asia In The Modern World Credits: 3.00
- HIST 24300 - South Asian History And Civilizations Credits: 3.00
- HIST 24600 - Modern Middle East And North Africa Credits: 3.00
- HIST 25000 - United States Relations With The Middle East And North Africa Credits: 3.00
- HIST 27100 - Introduction To Colonial Latin American History (1492-1810) Credits: 3.00
- HIST 27200 - Introduction To Modern Latin American History (1810 To The Present) Credits: 3.00
- HIST 30200 - Historical Topics Credits: 3.00
- HIST 30305 - Food In Modern America Credits: 3.00
- HIST 30505 - The United States In The World 1898-Present Credits: 3.00
- HIST 31205 - The Arab-Israeli Conflict Credits: 3.00
- HIST 31405 - Science, Technology, Engineering And Mathematics (STEM) And Gender Credits: 3.00
- HIST 31700 - A History Of The Christian Church And The Expansion Of Christianity I Credits: 3.00
- HIST 32050 - Spain: The First Global Empire, 1469-1713 Credits: 3.00
- HIST 32300 - German History Credits: 3.00
- HIST 32400 - Modern France Credits: 3.00
- HIST 32900 - History Of Women In Modern Europe Credits: 3.00
- HIST 33505 - Nationalism And Socialism In East Central Europe Credits: 3.00
- HIST 33300 - Science And Society In Western Civilization I Credits: 3.00
- HIST 33400 - Science And Society In Western Civilization II Credits: 3.00
- HIST 33700 - Europe Since 1945 Credits: 3.00
- HIST 33805 - History Of Human Rights Credits: 3.00
- HIST 33900 - Traditional China Credits: 3.00
- HIST 34000 - Modern China Credits: 3.00
- HIST 34300 - Traditional Japan Credits: 3.00
- HIST 34400 - History Of Modern Japan Credits: 3.00
- HIST 34505 - Arabs in American Eyes Credits: 3.00
- HIST 34705 - History Of Religion In America Credits: 3.00
- HIST 35100 - The Second World War Credits: 3.00
- HIST 35305 - Sports In America Credits: 3.00
- HIST 35400 - Women In America To 1870 Credits: 3.00
- HIST 35900 - Gender In East Asian History Credits: 3.00
- HIST 36600 - Hispanic Heritage Of The United States Credits: 3.00
- HIST 37005 - Queens And Empresses In Early Modern Europe Credits: 3.00
- HIST 37100 - Society, Culture, And Rock And Roll Credits: 3.00
- HIST 37200 - History Of The American West Credits: 3.00
- HIST 37500 - Women In America Since 1870 Credits: 3.00
- HIST 37700 - History And Culture Of Native America Credits: 3.00
- HIST 38001 - History Of United States Agriculture Credits: 3.00
- HIST 38105 - American Indians And Film Credits: 3.00
- HIST 38400 - History Of Aviation Credits: 3.00
- HIST 38700 - History Of The Space Age Credits: 3.00
- HIST 39500 - Junior Research Seminar Credits: 3.00
  Afro Amer Athl & Civil Rights, Gender & War in Modern Europe, German-Occupied Europe, Indian Crossroads-
  Colonial City, Occupied Europe, Politics Mod Latin America, The Civil Rights Movement, Sex, Race, & Science,
  Northern Indian Removal
- HIST 39600 - African American History To 1877 Credits: 3.00
- HIST 39800 - African American History Since 1877 Credits: 3.00
- HIST 40300 - Europe In The Reformation Credits: 3.00
- HIST 40500 - The French Revolution And Napoleon Credits: 3.00
- HIST 40600 - Rebels And Romantics: Europe 1815-1870 Credits: 3.00
- HIST 40700 - Road To World War I: Europe 1870-1919 Credits: 3.00
- HIST 40800 - Dictatorship And Democracy: Europe 1919-1945 Credits: 3.00
- HIST 41005 - History Of The American Presidency Credits: 3.00
- HIST 41300 - Modern European Imperialism: Repression And Resistance Credits: 3.00
- HIST 41505 - Gender And Politics In Early Modern Europe Credits: 3.00
- HIST 42300 - Advanced Topics In Modern Germany Credits: 3.00
  Divided Germany,&nbsp;Divided Germany & the Cold War,&nbsp;Germany & France: War, Peace & Memory
- HIST 44100 - Africa In The Twentieth Century Credits: 3.00
- HIST 46900 - Black Civil Rights Movement Credits: 3.00
- HIST 47005 - Women And Health In America Credits: 3.00
- HIST 47700 - Native American Women's History Credits: 3.00
- HIST 48800 - History Of Sexual Regulation In The United States Credits: 3.00
- HIST 49200 - Seminar In Historical Topics Credits: 3.00
18th-Century Pacific Worlds, Afro American & Amer Labor Movement, Catholic Priests & Nuns Movies, Gauchos and Cowboys on the Argentine Frontier, History Of Argentina, History of Argentina 1810-Present, Late Imperial China, Life & Career of Winston Churchill, Race, Gender, Culture US - Honors, Gender Revolution in Modern American, Indian Removal 19th Cent US, Interwar Jewish Experiences in E. Central Europe, Russia, and Middle East, Native America and Colonial Settlement, Rel & Pol In Mid Amer, Spain in American Southwest, War and Gender, Women Modern America 1950-Pres

- HIST 49500 - Research Seminar In Historical Topics Credits: 3.00
  Gender Revolution in Modern American, Indian Removal 19th Cent US, Interwar Jewish Experiences in E. Central Europe, Russia, and Middle East, Native America and Colonial Settlement, Rel & Pol In Mid Amer, Spain in American Southwest, War and Gender, Women Modern America 1950-Pres

- HIST 51200 - England Under The Stuarts Credits: 3.00

- HIST 57600 - Problems In Latin American History Credits: 3.00

- HIST 59500 - The Holocaust And Genocide Credits: 3.00

- HONR 29900 - Interdisciplinary Honors - Experiential Learning Credits: 1.00 to 6.00
  Learning Across Differences

- HONR 31400 - The Human Epoch Credits: 3.00

- HONR 31500 - Across Differences Credits: 3.00

- HONR 39900 - Interdisciplinary Honors - Special Topics Seminar Credits: 1.00 to 6.00
  Introduction to Visual Studies, Disability and Technoscience, Beyond Afghanistan, Race in American Popular Music

- HTM 37200 - Global Tourism Geography Credits: 3.00

- IDIS 49000 - Directed Reading In Interdisciplinary Studies Credits: 1.00 to 3.00
  Internship in Asian Am Stds

- IDIS 49100 - Special Topics In Interdisciplinary Studies Credits: 1.00 to 4.00
  Arabic Culture, British Literature, Cultural Orphans in Latin America, Gender & Medieval Religion, Intro to Islamic Civ & Cul, Jewish Cinema, Race & Religion in the US, Religion & Violence, Two Koreas: Pol Econ Rivalry, Women Writers in Translation

- IE 49000 - Special Topics In Industrial Engineering Credits: 1.00 to 6.00
  Grnd Challngs in Accessibility

- ITAL 10100 - Italian Level I Credits: 3.00

- ITAL 10500 - Accelerated Basic Italian Credits: 3.00

- ITAL 11200 - Elementary Italian Conversation Credits: 1.00

- ITAL 20100 - Italian Level III Credits: 3.00

- ITAL 20200 - Italian Level IV Credits: 3.00

- ITAL 21200 - Intermediate Italian Conversation Credits: 1.00

- ITAL 23100 - Dante's Divine Comedy Credits: 3.00

- ITAL 28100 - The Italian Renaissance And Its Scientific And Cultural Impact On Western Civilization Credits: 3.00

- ITAL 30100 - Italian Level V Credits: 3.00

- ITAL 33000 - The Italian Cinema Credits: 3.00

- ITAL 33300 - The Spirit Of Italian Comedy Credits: 3.00

- ITAL 33500 - Italian-American Cinema Credits: 3.00

- ITAL 34100 - Italian Literature I: From The Middle Ages To The Enlightenment Credits: 3.00

- ITAL 34200 - Italian Literature II: From Romanticism To The Present Credits: 3.00

- ITAL 39300 - Special Topics In Italian Literature Or Cinema Credits: 3.00
  Italian Women Writers in Translation, Mafia and the Movies

- ITAL 49300 - Advanced Topics In Italian Literature Or Cinema Credits: 3.00
  Mafia & the Movies

- JPNS 10100 - Japanese Level I Credits: 3.00 or 4.00

- JPNS 10200 - Japanese Level II Credits: 0.00 to 4.00
• JPNS 20100 - Japanese Level III Credits: 3.00 or 4.00
• JPNS 20200 - Japanese Level IV Credits: 3.00 or 4.00
• JPNS 23000 - Japanese Literature In Translation Credits: 3.00
• JPNS 24100 - Introduction To The Study Of Japanese Literature Credits: 3.00
• JPNS 28000 - Introduction To Modern Japanese Civilization Credits: 3.00
• JPNS 33000 - Japanese Cinema Credits: 3.00
• JPNS 34100 - Japanese Literature I: Modern Japanese Literature Credits: 3.00
• JPNS 36300 - Relationship Of Japanese Language And Society Credits: 3.00
• JPNS 40100 - Japanese Level VII Credits: 3.00
• JPNS 48500 - Culinary Culture Of Japan Credits: 3.00
• JPNS 49000 - Special Topics In Japanese Language Credits: 1.00 to 3.00
  Contemporary Japanese Popular Literature & Culture, Japanese Society Through Songs, JPNS Cinema II:Enter & Othr
  Fm, Japanese Visual Culture, Japanese Songs
• JPNS 59400 - Special Topics In Japanese Literature Credits: 1.00 to 4.00
  Modern Japanese Fiction
• KOR 10100 - Korean Level I Credits: 4.00
• KOR 10200 - Korean Level II Credits: 4.00
• KOR 20100 - Korean Level III Credits: 4.00
• KOR 20200 - Korean Level IV Credits: 4.00
• KOR 30100 - Korean Level V Credits: 3.00
• KOR 30200 - Korean Level VI Credits: 3.00
• JWST 33000 - Introduction To Jewish Studies Credits: 3.00
• KOR 33000 - Introduction To Korean Cinema Credits: 3.00
• KOR 38000 - Special Topics In Korean Culture Credits: 3.00
  Intro to Korean Cinema
  Introduction to Korean Culture,
  Dating, Sex & Marriage - Korea
• KOR 48000 - Special Topics In Korean Studies Credits: 3.00
  KPop: Gen, Iden, Indus & Fan
• LALS 25000 - Introduction To Latin American And Latino Studies Credits: 3.00
• LALS 26000 - U S Latino Culture Credits: 3.00
• LALS 30100 - Latin American Literary And Cultural Studies Credits: 3.00
  Hispanic Lit I
• LALS 34700 - Latin American Politics Credits: 3.00
• LALS 40100 - Special Topics In Latin American/Latino Studies Credits: 3.00
  Latin Amer Civliztn, Latin American Culture, Latina Feminisms
• LATN 34300 - Roman Oratory Credits: 3.00
• LATN 34400 - Roman Epic Credits: 3.00
• LATN 34500 - Roman Elegy Credits: 3.00
• LATN 34700 - Roman Comedy Credits: 3.00
• LATN 44300 - Roman Satire Credits: 3.00
• LATN 44400 - Roman Philosophers Credits: 3.00
• LATN 44600 - Roman Historians Credits: 3.00
• LC 23000 - Crossing Borders: Introduction To Comparative Literature Credits: 3.00
  Intro to Islami Civ & Cul, Arabic Culture, Arabic Literature in Translati
• LC 23500 - East Asian Literature In Translation Credits: 3.00
• LC 23700 - Our Common Bond: Languages And Cultures In A Global Context Credits: 3.00
• LC 33800 - Language Through Films Credits: 3.00
• LC 23900 - Women Writers In Translation Credits: 3.00
• LC 33100 - Comparative Literature In Translation Credits: 3.00
  Kabbalah and Jewish Mysticism, Topics in Brazilian Culture, The Middle Ages on Film
• LC 33300 - The Middle Ages On Film Credits: 3.00
• LC 49000 - Special Topics In Foreign Languages And Literatures Credits: 1.00 to 4.00
  Korean Language in Culture & Society, BTS and Kpop Culture, Bible & Early Interp, The Hispanic World, Cold War Cultures in Korea, Food Culture in Russia
• LC 59300 - Special Topics In Literature Credits: 1.00 to 4.00
  ModEuroRhetoric, Poetics, Narrativity
• LING 36800 - Sociolinguistic Study Of African American English Credits: 3.00
• LING 39800 - Special Topics In Linguistics I Credits: 3.00
  Language & Society
• LING 49800 - Special Topics In Linguistics II Credits: 3.00
  History Spanish Lang, Intro Langua Culture
• MARS 22000 - Introduction To Medieval And Renaissance Studies Credits: 3.00
  The Tudors, Renaissance Mind: Florence 1300-1600, The Bible as Literature: The New Testament, Tudors in Literature and Film
• MARS 42000 - Medieval And Renaissance Studies Seminar Credits: 3.00
  Tudors in Literature and Film
• ME 29000 - Global Engineering Professional Seminar Credits: 1.00
• MGMT 24300 - Contemporary Thought Of Minorities In Management Credits: 3.00
• MGMT 29300 - Diversity In The Workplace Credits: 3.00
• MGMT 29400 - Navigating Gender In The Workplace Credits: 3.00
• MGMT 33100 - Development And Impact of Equal Employment Law Credits: 3.00
• MGMT 42210 - International Marketing Credits: 3.00
• MGMT 44310 - China, America And Artificial Intelligence Credits: 3.00
• MGMT 45900 - International Management Credits: 3.00
• MUS 37600 - World Music Credits: 3.00
• MUS 49000 - Guided Reading In Music Credits: 1.00 to 6.00
  History of Rock Music
• NUR 41801 - Clinical Capstone And Issues In Professional Practice Credits: 4.00
• OLS 33000 - Diet Selection And Planning Credits: 3.00
• OLS 45400 - Gender And Diversity In Management Credits: 3.00
• OLS 45600 - Leadership In A Global Environment Credits: 3.00
• PHIL 11000 - The Big Questions: Introduction To Philosophy Credits: 3.00
• PHIL 11400 - Global Moral Issues Credits: 3.00
• PHIL 20600 - Introduction To Philosophy Of Religion Credits: 3.00
• PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00
• PHIL 20800 - Ethics Of Data Science Credits: 3.00
• PHIL 22500 - Philosophy And Gender Credits: 3.00
• PHIL 23000 - Religions Of The East Credits: 3.00
• PHIL 23100 - Religions Of The West Credits: 3.00
• PHIL 24200 - Philosophy, Culture, And The African American Experience Credits: 3.00
• PHIL 27000 - Biomedical Ethics Credits: 3.00
• PHIL 28000 - Ethics And Animals Credits: 3.00
• PHIL 29000 - Environmental Ethics Credits: 3.00
• PHIL 29300 - Selected Topics In Philosophy Credits: 1.00 to 3.00
  Science and Religion
• PHIL 30100 - History Of Ancient Philosophy Credits: 3.00
• PHIL 30200 - History Of Medieval Philosophy Credits: 3.00
• PHIL 30300 - History Of Modern Philosophy Credits: 3.00
• PHIL 40200 - Studies In Medieval Christian Thought Credits: 3.00
• PHIL 40600 - Intermediate Philosophy Of Religion Credits: 3.00
• PHIL 49000 - Advanced Topics In Philosophy Credits: 1.00 to 3.00
  Early Greek Philosophy, Philosophy of Race
• PHIL 50100 - Studies In Greek Philosophy Credits: 3.00
• PHIL 50500 - Islamic And Jewish Philosophy And The Classical Tradition Credits: 3.00
• PHIL 50600 - Advanced Philosophy Of Religion Credits: 3.00
• POL 13000 - Introduction To International Relations Credits: 3.00
• POL 14100 - Governments Of The World Credits: 3.00
• POL 15000 - Introduction To Political Thought Credits: 3.00
• POL 22200 - Women, Politics, And Public Policy Credits: 3.00
• POL 22900 - Emerging Problems In Political Science Credits: 1.00 to 3.00
  The US, Cuba & Latin America
• POL 23100 - Introduction To United States Foreign Policy Credits: 3.00
• POL 23500 - International Relations Among Rich And Poor Nations Credits: 3.00
• POL 23700 - Modern Weapons And International Relations Credits: 3.00
• POL 32300 - Comparative Environmental Policy Credits: 3.00
• POL 32600 - Black Political Participation In America Credits: 3.00
• POL 32700 - Global Green Politics Credits: 3.00
• POL 33500 - China And The Challenges Of Globalization Credits: 3.00
• POL 34500 - West European Democracies In The Post-Industrial Era Credits: 3.00
• POL 34700 - Introduction To Latin American Politics Credits: 3.00
• POL 34800 - East Asian Politics Credits: 3.00
• POL 35100 - Foundations Of Western Political Theory: From Plato To The Reformation Credits: 3.00
• POL 36000 - Women And The Law Credits: 3.00
• POL 41500 - US Politics And The Media Credits: 3.00
• POL 42300 - International Environmental Policy Credits: 3.00
• POL 42900 - Contemporary Political Problems Credits: 3.00
  LGBTQ+ Politics, Pol & Econ Dev in Latin Amer
• POL 43000 - Selected Problems In International Relations Credits: 3.00
  IR: The Iraq Wars, Theories of IR
• POL 43801 - International Human Rights Credits: 3.00
• POL 49100 - Political Science Senior Seminar Credits: 3.00
  American Race Relations, Public Policy: Race, Class, Gender; Race, Class and Political Representation; Race, Gender
  & Political Representation, The Iraq Wars, Politics of Japan and China, The Rise and Fall of Dictators, Global
  Governance
• POL 49300 - Interdisciplinary Undergraduate Seminar Credits: 1.00 to 3.00
  Introduction to Jewish Studies
• POL 52000 - Special Topics In Public Policy Credits: 3.00
  Diversity Equity Inclusion; Gender, Race, And Class: Public Policy
• PSY 24000 - Introduction To Social Psychology Credits: 3.00
• PSY 23900 - The Psychology Of Women Credits: 3.00
• PSY 24400 - Introduction To Human Sexuality Credits: 3.00
• PSY 33500 - Stereotyping And Prejudice Credits: 3.00
• PSY 34200 - Introduction To Psychology Of Personality Credits: 3.00
• PSY 39200 - Special Topics In Psychology Credits: 1.00 to 3.00
  Diversity and Inclusion, Belonging and Exclusion, Cultural Psychology, Psychology of Gender
• PSY 42100 - Alcohol Use And Disorders Credits: 3.00
- PSY 43600 - Foods And Behavior Credits: 3.00
- PSY 59100 - Topics In Psychology Credits: 1.00 to 3.00
  Acceptance and Inclusion, Cross Cultural Social Psy, Ethnic Minority Issues in Psy
- PTGS 10100 - Portuguese Level I Credits: 3.00
- PTGS 10200 - Portuguese Level II Credits: 3.00
- PTGS 10500 - Accelerated Portuguese Credits: 3.00
- PTGS 20100 - Portuguese Level III Credits: 3.00
- PTGS 20200 - Portuguese Level IV Credits: 3.00
- PTGS 23500 - Luso-Brazilian Literature In Translation Credits: 3.00
- PTGS 33000 - Brazilian, Portuguese, And African Cinema Credits: 3.00
- PTGS 55100 - Brazilian Poetry Credits: 3.00
- PTGS 55500 - Brazilian Drama Credits: 3.00
- PTGS 55700 - Brazilian Fiction Credits: 3.00
- PTGS 59400 - Special Topics In Luso-Brazilian Literature Credits: 1.00 to 4.00
  Clarice Lispector, Latin American Short Story, Luso-Brazilian Literature, Machado De Assis
- PUBH 22500 - Contemporary Women's Health Credits: 3.00
- PUBH 51100 - Foundations Of Global Health Credits: 3.00
- REL 20000 - Introduction To The Study Of Religion Credits: 3.00
- REL 20100 - Interpretation Of The New Testament Credits: 3.00
- REL 20200 - Interpretation Of The Old Testament Credits: 3.00
- REL 20300 - Theology Of Paul Credits: 3.00
- REL 20400 - Introduction To Christian Theology Credits: 3.00
- REL 23000 - Religions Of The East Credits: 3.00
- REL 23100 - Religions Of The West Credits: 3.00
- REL 25000 - A History Of The Christian Afterlife Credits: 3.00
- REL 31700 - Ancient Judaism And Early Christianity Credits: 3.00
- REL 31800 - The Bible And Its Early Interpreters Credits: 3.00
- REL 35100 - Christian Mysticism Credits: 3.00
- REL 45000 - Christian Ethics Credits: 3.00
- REL 45100 - Christology Credits: 3.00
- REL 45200 - Systematic Theology Credits: 3.00
- REL 49100 - Special Topics In Religious Studies Credits: 3.00
  Engaging Religious Diversity, Rhetorics of Religion
- RUSS 10100 - Russian Level I Credits: 4.00
- RUSS 10200 - Russian Level II Credits: 4.00
- RUSS 11100 - Conversation Supplement To Russian Level I Credits: 1.00
- RUSS 11200 - Conversation Supplement To Russian Level II Credits: 1.00
- RUSS 20100 - Russian Level III Credits: 4.00
- RUSS 20200 - Russian Level IV Credits: 4.00
- RUSS 21100 - Conversation Supplement To Russian Level III Credits: 1.00
- RUSS 21200 - Conversation Supplement To Russian Level IV Credits: 1.00
- RUSS 29800 - Special Topics In Russian Credits: 3.00
  Russian Fairy Tales, Russian and Slavic Fairy Tales, Food Culture in Russia
- RUSS 33000 - Russian And East European Cinema Credits: 3.00
- RUSS 34100 - Russian Literature In The Nineteenth Century Credits: 3.00
- RUSS 34200 - Revolution, Repression, Renewal: Soviet Literature And Beyond Credits: 3.00
- RUSS 38000 - Russian Culture And Civilization I Credits: 3.00
- RUSS 38100 - Russian Culture And Civilization II Credits: 3.00
• RUSS 40100 - Russian Level VII Credits: 3.00
• RUSS 40200 - Russian Level VIII Credits: 3.00
• RUSS 42400 - Business Russian Credits: 3.00
• RUSS 49700 - Topics In Russian Literature Credits: 3.00 to 6.00
  Dostoevsky and His Age, Tolstoy and His Age
• RUSS 49800 - Topics In Russian Culture Credits: 3.00 to 6.00
  Post-Soviet Russian Cinema
• SCI 10000 - Multicultural Leadership Seminar Credits: 1.00
• SFS 30200 - Principles Of Sustainability Credits: 3.00
• SFS 41100 - Structural Racism In US Agriculture Credits: 1.00
• SFS 41200 - Colonialism, Globalization, And Food Justice Credits: 1.00
• SFS 41300 - The Cultures And Agricultures Of The United States Credits: 1.00
• SLHS 22700 - Elements Of Linguistics Credits: 3.00
• SOC 10000 - Introductory Sociology Credits: 3.00
• SOC 22000 - Social Problems Credits: 3.00
• SOC 26700 - Religion In The Modern World Credits: 3.00
• SOC 31000 - Race And Ethnicity Credits: 3.00
• SOC 32700 - Crime, Deviance And Mass Media Credits: 3.00
• SOC 32800 - Criminal Justice Credits: 3.00
• SOC 33500 - Political Sociology Credits: 3.00
• SOC 33800 - Global Social Movements Credits: 3.00
• SOC 33900 - Sociology Of Global Development Credits: 3.00
• SOC 34000 - General Social Psychology Credits: 3.00
• SOC 34400 - Environmental Sociology Credits: 3.00
• SOC 35000 - Sociology Of Family Credits: 3.00
• SOC 35200 - Drugs, Culture, And Society Credits: 3.00
• SOC 35600 - Hate And Violence Credits: 3.00
• SOC 36700 - Religion In America Credits: 3.00
• SOC 36900 - Religion And Chinese Society Credits: 3.00
• SOC 39100 - Selected Topics In Sociology Credits: 1.00 to 3.00
  Sociology of Policing, Analyzing Culture on TV
• SOC 40900 - Social Networks Credits: 3.00
• SOC 41100 - Social Inequality Credits: 3.00
• SOC 42900 - Sociology Of Protest Credits: 3.00
• SOC 45000 - Gender Roles In Modern Society Credits: 3.00
• SOC 46100 - Health And Social Behavior Credits: 3.00
• SPAN 10100 - Spanish Level I Credits: 3.00
• SPAN 10200 - Spanish Level II Credits: 3.00
• SPAN 11200 - Elementary Spanish Conversation Credits: 1.00
• SPAN 20100 - Spanish Level III Credits: 3.00
• SPAN 20200 - Spanish Level IV Credits: 3.00
• SPAN 21200 - Intermediate Spanish Conversation Credits: 1.00
• SPAN 23100 - Cervantes' Don Quixote Credits: 3.00
• SPAN 23500 - Spanish American Literature In Translation Credits: 3.00
• SPAN 24100 - Introduction To The Study Of Hispanic Literature Credits: 3.00
• SPAN 28000 - Second-Year Spanish: Special Topics Credits: 3.00
  Intro Latin Am & Latino Study
• SPAN 30100 - Spanish Level V Credits: 3.00
• SPAN 30200 - Spanish Level VI Credits: 3.00
• SPAN 30500 - Spanish For Heritage Speakers Credits: 3.00
• SPAN 30801 - Advanced Spanish For Heritage Speakers Credits: 3.00
• SPAN 32100 - Introduction To Spanish For The Professions Credits: 3.00
• SPAN 32200 - Spanish For The Health Professions Credits: 3.00
• SPAN 32500 - Spanish For Engineering And Technology Credits: 3.00
• SPAN 33000 - Spanish And Latin American Cinema Credits: 3.00
• SPAN 33500 - The Literature Of The Spanish-Speaking Peoples In The United States Credits: 3.00
• SPAN 34100 - Hispanic Literature I: Poetry And Drama Credits: 3.00
• SPAN 34200 - Hispanic Literature II: Prose Credits: 3.00
• SPAN 38000 - Spanish Language And Culture Abroad Credits: 3.00 to 6.00
• SPAN 39800 - Special Topics In Spanish Credits: 1.00 to 3.00
  The Hispanic World
• SPAN 40100 - Spanish Level VII Credits: 3.00
• SPAN 40200 - Spanish Level VIII Credits: 3.00
• SPAN 41500 - Spanish Translation And Interpreting Credits: 3.00
• SPAN 42400 - Business Spanish Credits: 3.00
• SPAN 48000 - Spanish Civilization Credits: 3.00
• SPAN 48100 - Spanish Culture Credits: 3.00
• SPAN 48200 - Latin American Civilization Credits: 3.00
• SPAN 48300 - Latin American Culture Credits: 3.00
• SPAN 48500 - Food And Culture In The Hispanic World Credits: 3.00
• SPAN 49800 - Advanced Topics In Spanish Credits: 1.00 to 3.00
  Chicana/o & Latina/o Lit Trans, Food Culture Hispanic World, Hispanic Film in Spanish, Spanglish in Ling & Cul, Don Quixote
• SPAN 54000 - Spanish Literature Of The Middle Ages Credits: 3.00
• SPAN 54100 - Spanish Literature Of The Golden Age Credits: 3.00
• SPAN 54200 - Cervantes Don Quijote Credits: 3.00
• SPAN 54300 - Spanish Literature Of The 18th And 19th Centuries Credits: 3.00
• SPAN 54500 - Spanish Literature Of The 20th Century Credits: 3.00
• SPAN 55000 - Spanish American Literature Of The Colonial Period Credits: 3.00
• SPAN 55100 - Spanish American Literature Of The 19th Century Credits: 3.00
• SPAN 55200 - Spanish American Literature From 1900 To 1970 Credits: 3.00
• SPAN 55300 - Spanish American Literature From 1970 - Present Credits: 3.00
• SPAN 55500 - Latino/a Literature Credits: 3.00
• SPAN 59000 - Directed Reading In Spanish Credits: 1.00 to 4.00
  Spanish American Novel
• SPAN 59400 - Special Topics In Hispanic Literature Credits: 1.00 to 4.00
  Hispanic Film in Spani Part II, Modern Spanish Comic Theater, Spanish Literature of the Middle Ages, Borders and Borderlands
• TECH 10100 - Women In Technology: Exploring The Possibilities Credits: 1.00
• TECH 33000 - Technology And The Global Society Credits: 3.00
• THTR 39000 - Directed Study Of Special Theatre Problems Credits: 1.00 to 3.00
  Black Drama
• TLI 35560 - Employment And Labor Law For The Human Resource Professionals Credits: 3.00
• WGSS 28000 - Women's, Gender, And Sexuality Studies: An Introduction Credits: 3.00
• WGSS 28100 - Variable Topics In Women's, Gender, And Sexuality Studies Credits: 1.00 to 4.00
Arab Women Writers, Contemporary Foreign Women Writers In Translation, Spanish American Literature in Translation, Wom Pol and Publ Pol, Women Writers in Translation, Women, Gender, And Leadership, 20th Century Women Artists, Intro to Study of Religion

- WGSS 28200 - Introduction To LGBTQ Studies Credits: 3.00
- WGSS 38000 - Comparative Studies In Gender And Culture Credits: 3.00
- WGSS 38100 - Women Of Color In The United States Credits: 3.00
- WGSS 38200 - Love, Sex And Sexuality Credits: 3.00
- WGSS 38300 - Women, Work, And Labor Credits: 3.00
- WGSS 39000 - Variable Topics In Women's, Gender And Sexuality Studies Credits: 1.00 to 4.00
  Gender and Politics in Early Modern Europe, Literature, Queer Studies & Disability, Queens & Empresses in Early Modern Europe, Sports & Popular Feminism, STEM and Gender, US Women Since 1870, Women and Health in America, Women and Leadership, Women and the Law, Hist of Sexual Regul in US, Gender and Literature, Feminist Technoscience Studies, Latina Feminisms
- WGSS 48000 - Feminist Theory Credits: 3.00
- WGSS 48200 - Interdisciplinary Studies In Sexuality Credits: 3.00
- WGSS 48300 - Feminisms In Global Perspective Credits: 3.00
- WGSS 48500 - Feminist Perspectives On Film Credits: 3.00
- WGSS 49200 - Practicum In Women's, Gender, and Sexuality Studies Credits: 2.00 to 4.00
- WGSS 49900 - Independent Study In Women's, Gender And Sexuality Studies Credits: 1.00 to 4.00
  African American Women and Activism, Black Women, Gender Revolution in Modern America, Women and Health in America
- WGSS 59900 - Selected Topics In Women's Gender And Sexuality Studies Credits: 3.00
  Bad Mothers in American Literature, Gender & Sexuality in Sport, Native Amer Women Writers, Public Pol and Family

**College of Science Core: General Education**

**Curricular Outcome**: Demonstrated breadth of knowledge and cultural appreciation. College of Science students will gain insights in the Humanities, Social Sciences, and/or Management to deepen their awareness of other disciplines of thought which complements and informs their scientific understanding of the world. The General Education requirement is met through completion of three courses (9 credits total) that have been approved to meet requirement. Students are encouraged to speak with their academic advisors about course options that expand their perspective and further develop analytical and critical thinking skills.

**Curricular Notices**

- Students may use only ONE course (3 credits) from the following subjects: AGEC, MGMT, OBHR, ECON, or ENTR to meet their general education requirement.
- Approved courses may be used in any combination to satisfy the General Education requirement. Note: Presence of a course on the list does not guarantee that the course will be available during all terms.
- Some courses on the General Education approved course list share the same course subject and number, however, they have different variable titles. Only those titles listed are approved. Consult with your advisor if you have a question about the suitability of a course.
- Courses which have been taken to meet the General Education requirement may not also be used to meet a student's Culture/Diversity (Language and Culture) or Great Issues requirement.
- College of Science students are invited to nominate courses for the general education requirement. Please submit course suggestions to your academic advisor.

*Fall, 2013 students and forward only.*
African American Studies (AAS)

- AAS 27100 - Introduction To African American Studies Credits: 3.00
- AAS 27700 - African American Popular Culture Credits: 3.00
- AAS 35900 - Black Women Writers Credits: 3.00
- AAS 37000 - Black Women Rising Credits: 3.00
- AAS 37500 - The Black Family Credits: 3.00
- AAS 37600 - The Black Male Credits: 3.00
- AAS 37800 - Caribbean History And Culture Credits: 3.00
- AAS 47300 - Blacks In Hollywood Film Credits: 3.00
- AAS 49100 - Special Topics In African American Studies Credits: 1.00 to 4.00 African-American Protest Lit, Afro Borinquen Cult&Identity, Black Satire and Humor, Carnival: Re-member Diasp Trad, Contemporary Issues in Black Education, Identity in the Midst of Differences, Teaching the Wire, The Classics and Black Literature, W.E.B. Du Bois, African American Chorl Foundtns, Cultural Heritage, Africa in 20th Century
- AAS 57500 - Theories Of African American Studies Credits: 3.00

Approved Courses by Subject

Art & Design (AD)

- AD 12500 - Introduction To Interior Design Credits: 3.00
- AD 22600 - History Of Art To 1400 Credits: 3.00
- AD 22700 - History Of Art Since 1400 Credits: 3.00
- AD 25100 - History Of Photography I Credits: 3.00
- AD 25500 - Art Appreciation Credits: 3.00
- AD 31100 - Ancient Greek Art Credits: 3.00
- AD 31200 - Ancient Roman Art Credits: 3.00
- AD 33400 - New Media Culture Credits: 3.00
- AD 33900 - Women Artists In The 20th Century Credits: 3.00
- AD 34300 - Northern Renaissance Art Credits: 3.00
- AD 34400 - Latin American Art In The 20th Century Credits: 3.00
- AD 34600 - Italian Renaissance Art Credits: 3.00
- AD 34800 - History Of Islamic Art Credits: 3.00
- AD 35900 - Medieval European Art Credits: 3.00
- AD 38000 - Baroque Art Credits: 3.00
- AD 38200 - A Global History Of Modern Art Credits: 3.00
- AD 38300 - Modern Art Credits: 3.00
- AD 38400 - Contemporary Art Credits: 3.00
• AD 38500 - History Of Interior Design Credits: 3.00
• AD 39100 - History Of Chinese Art Credits: 3.00
• AD 39500 - History Of Design Credits: 3.00
• AD 45400 - Modern Architecture Credits: 3.00

Agricultural Economics (AGEC)

• AGEC 21700 - Economics Credits: 3.00 (satisfies BSS for core)

American Studies (AMST)

• AMT 10100 - America And The World Credits: 3.00
• AMT 20100 - Interpreting America Credits: 3.00 African American Pop Culture, American Social Movements - Honors, Asian American Pop Culture, Automobiles in America, Fan Users and Games, Global Habitats, Community Development & Sustainability, Electronic Music & Pop Culture, Fashion & Technology, Interpreting America, Intro Asian American Studies, Intro to American Studies: Arab-American Literature, Global habitats, Community Development & Sustainability, Asian American Pop Culture, Interpreting America: Arab-American Lit (select options may satisfy HUM for core)
• AMT 31000 - Invention, Innovation, And Design Credits: 3.00
• AMT 32000 - Understanding The National Football League Credits: 3.00
• AMT 32500 - Sports, Technology, And Innovation Credits: 3.00

Animal Sciences (ANSC)

• ANSC 33100 - The Role Of Horses In Human History, Culture, And Society Credits: 3.00

Anthropology (ANTH)

• ANTH 10000 - Being Human: Introduction To Anthropology Credits: 3.00
• ANTH 20100 - Introduction To Archaeology And World Prehistory Credits: 3.00
• ANTH 20300 - Biological Bases Of Human Social Behavior Credits: 3.00
• ANTH 20400 - Human Origins Credits: 3.00
• ANTH 20500 - Human Cultural Diversity Credits: 3.00
• ANTH 21000 - Technology And Culture Credits: 3.00
• ANTH 21200 - Culture, Food And Health Credits: 3.00
- ANTH 23000 - Gender Across Cultures Credits: 3.00
- ANTH 23500 - The Great Apes Credits: 3.00
- ANTH 25400 - Archaeological Hoaxes, Myths And Frauds Credits: 3.00
- ANTH 25600 - Archaeology Of Beer Credits: 3.00
- ANTH 28200 - Introduction To LGBTQ Studies Credits: 3.00
- ANTH 30700 - The Development Of Contemporary Anthropological Theory Credits: 3.00
- ANTH 31000 - Mortuary Practices Across Cultures Credits: 3.00
- ANTH 31100 - The Archaeology Of The Ancient Andes Credits: 3.00
- ANTH 31200 - The Archaeology Of Ancient Egypt And The Near East Credits: 3.00
- ANTH 31300 - Archaeology Of North America Credits: 3.00
- ANTH 32000 - Ancient States And Empires Credits: 3.00
- ANTH 32700 - Environment And Culture Credits: 3.00
- ANTH 33500 - Primate Behavior Credits: 3.00
- ANTH 33600 - Human Variation Credits: 3.00
- ANTH 33700 - Human Diet: Origins And Evolution Credits: 3.00
- ANTH 34000 - Global Perspectives On Health Credits: 3.00
- ANTH 34100 - Culture And Personality Credits: 3.00
- ANTH 35800 - African Cultures Credits: 3.00
- ANTH 37000 - Ethnicity And Culture Credits: 3.00
- ANTH 37300 - Anthropology Of Religion Credits: 3.00
- ANTH 37700 - Anthropology Of Hunter-Gatherer Societies Credits: 3.00
- ANTH 37800 - Archaeology And Cultural Anthropology Of Mesoamerica (Mexico, Belize And Guatemala) Credits: 3.00
- ANTH 37900 - Native American Cultures Credits: 3.00
- ANTH 38000 - Using Anthropology In The World Credits: 3.00
- ANTH 38400 - Designing For People: Anthropological Approaches Credits: 3.00
- ANTH 39200 - Comparative Social Organization Credits: 3.00
- ANTH 39200 - Selected Topics In Anthropology Credits: 1.00 to 3.00
- ANTH 41400 - Introduction To Language And Culture Credits: 3.00
- ANTH 42500 - Archaeological Method And Theory Credits: 3.00
- ANTH 43600 - Human Evolution Credits: 3.00
- ANTH 48200 - Sexual Diversity In Global Perspectives Credits: 3.00
- ANTH 50400 - Archaeological Theory Credits: 3.00
- ANTH 50500 - Culture And Society Credits: 3.00
- ANTH 50700 - History Of Theory In Anthropology Credits: 3.00
- ANTH 53400 - Human Osteology Credits: 3.00
- ANTH 53500 - Foundations Of Biological Anthropology Credits: 3.00
- ANTH 53600 - Primate Ecology Credits: 3.00
- ANTH 57500 - Economic Anthropology Credits: 3.00
• ANTH 59200 - Selected Topics In Anthropology Credits: 1.00 to 3.00 Anth Ed: Race, Gender, Class & Idnt, Applied Anthropology, Developmental Anthropology, Evidence and Expertise, Human Genitals and Cultures, Medical Anthropology, Anthropology of Aging, Climate Change in Antiquity

Arabic (ARAB)

• ARAB 23000 - Arabic Literature In Translation Credits: 3.00
• ARAB 23900 - Arab Women Writers Credits: 3.00
• ARAB 28000 - Arabic Culture Credits: 3.00 (satisfies HUM for core)
• ARAB 28100 - Introduction To Islamic Civilization And Culture Credits: 3.00
• ARAB 33400 - North African Literature And Culture Credits: 3.00
• ARAB 58700 - Modern Arab Thought Credits: 3.00

Asian American Studies (ASAM)

• ASAM 24000 - Introduction To Asian American Studies Credits: 3.00
• ASAM 34000 - Contemporary Issues In Asian American Studies Credits: 3.00 Afro-Asia Pol & Cul Alli, Introduction To Asian American Studies, Asian American PopCult, Contemporary Issues In Asian American Studies, Conttmp Issue ASAM: Disney, Social Issues in Immigration

Agricultural Sciences, Education, & Communication (ASEC)

• ASEC 33100 - The Role Of Horses In Human History, Culture And Society Credits: 3.00
• ASEC 49100 - Special Topics In Agricultural Science And Education Communication Credits: 1.00 to 3.00 Consequences of Race and Privilege in Today’s American

American Sign Language (ASL)

• ASL 28000 - American Deaf Community: Language, Culture, And Society Credits: 3.00

Chinese (CHNS)

• CHNS 24100 - Introduction To The Study Of Chinese Literature Credits: 3.00
• CHNS 28000 - Topics In Chinese Civilization And Culture Credits: 3.00 Chinese Culture
• CHNS 28100 - Introduction To Chinese Food Culture Credits: 3.00
• CHNS 33000 - Introduction To Chinese Cinema Credits: 3.00
• CHNS 34100 - Chinese Literature I: Traditional Chinese Literature Credits: 3.00
• CHNS 34200 - Chinese Literature II: Modern Chinese Literature Credits: 3.00
• CHNS 49000 - Special Topics In Chinese Language Credits: 1.00 to 3.00 Food Culture Drinks and Snacks, Intro to Chinese Food Culture, Introductions to Chinese Films
• CHNS 59400 - Special Topics In Chinese Literature Credits: 1.00 to 4.00 Chinese Classical Tales, Chinese Lit and Culture, Chinese Poetry & Painting, Dream of Red Chamber, Modern Chinese Theatre, Poetry of Li Bae and Du Fu, Special Topics in Chinese Literature, Tang Dynasty Poetry

Classics (CLCS)
• CLCS 18100 - Classical World Civilizations Credits: 3.00
• CLCS 23010 - Survey Of Greek Literature In Translation Credits: 3.00
• CLCS 23100 - Survey Of Latin Literature Credits: 3.00
• CLCS 23300 - Comparative Mythology Credits: 3.00
• CLCS 23500 - Introduction To Classical Mythology Credits: 3.00
• CLCS 23700 - Gender And Sexuality In Greek And Roman Antiquity Credits: 3.00
• CLCS 23800 - The Tragic Vision Credits: 3.00
• CLCS 23900 - The Comic Vision Credits: 3.00
• CLCS 28000 - Topics In Classical Civilization Credits: 3.00 Ancient Near Eastern History & Culture, Culture and Society in the Age of Pericles, Studies in Greek Warfare
• CLCS 33700 - The Ancient Epic Credits: 3.00
• CLCS 38000 - Alexander The Great And Hellenistic World Credits: 3.00
• CLCS 38100 - Julius Caesar: Statesman, Soldier, Citizen Credits: 3.00
• CLCS 38300 - The Roman Empire Credits: 3.00
• CLCS 38400 - Ancient Western Medicine Credits: 3.00
• CLCS 38500 - Science, Medicine And Magic In The Ancient West Credits: 3.00
• CLCS 38600 - Ancient Greek Religion Credits: 3.00
• CLCS 38700 - Roman Religion Credits: 3.00
• CLCS 48000 - Potters And Society In Antiquity Credits: 3.00
• CLCS 48100 - Culture And Society In The Age Of Pericles Credits: 3.00
• CLCS 48300 - Republican Rome Credits: 3.00
• CLCS 59300 - Special Topics In Classical Literature Credits: 1.00 to 4.00 The Classics and Black Literature

Comparative Literature (CMPL)

• CMPL 23000 - Crossing Borders: Introduction To Comparative Literature Credits: 3.00 Arab Women Writers, Arab-American Literature, Arabic Culture, Arthurian Lit: Medieval to Mod, Brit Lit thru 18 Ct, Dragons, Intro to Comparative and Arabic Literature, Intro to Comparative Literature, Intro to Islamic Civ & Cul, Israel & the Modern World, Italian Women Writers in Translation, Myths & Legends: Elves to Elvis, Nature in German Literature, Philosophy of Art, Russian Literature II, Soviet Literature and Beyond, Spanish American Literature in Translation, Women Writers in Translation, North African Lit & Culture, The Comic Vision, A Brief History of Doom, &nbsp;German Literature in Translation
• CMPL 26600 - World Literature: From The Beginnings To 1700 A D Credits: 3.00
• CMPL 26700 - World Literature: From 1700 A D To The Present Credits: 3.00
• CMPL 33000 - International Cinema Credits: 3.00

Communication (COM)

• COM 22400 - Communicating In The Global Workplace Credits: 3.00
• COM 25000 - Mass Communication And Society Credits: 3.00
• COM 25100 - Communication, Information, And Society Credits: 3.00
• COM 31200 - Rhetoric In The Western World Credits: 3.00
• COM 31400 - Advanced Presentational Speaking Credits: 3.00
• COM 31500 - Speech Communication Of Technical Information Credits: 3.00
• COM 31800 - Principles Of Persuasion Credits: 3.00
• COM 32000 - Small Group Communication Credits: 3.00
• COM 35100 - Mass Communication Ethics Credits: 3.00
Dance (DANC)

- DANC 37800 - Survey Of Concert Dance History Credits: 3.00

Economics (ECON)

- ECON 21000 - Principles Of Economics Credits: 3.00
- ECON 25100 - Microeconomics Credits: 3.00
- ECON 25200 - Macroeconomics Credits: 3.00

Educational and Psychology Studies (EDPS)

- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00
- EDPS 31500 - Collaborative Leadership: Interpersonal Skills Credits: 3.00
- EDPS 31600 - Collaborative Leadership: Cross-Cultural Settings Credits: 3.00
- EDPS 31700 - Collaborative Leadership: Mentoring Credits: 3.00

English (ENGL)

- ENGL 20200 - Engaging English Credits: 3.00
- ENGL 21700 - Figures Of Myth And Legend I: Monsters Credits: 3.00
- ENGL 21800 - Figures Of Myth And Legends II: Heroes And Villains Credits: 3.00
- ENGL 21900 - Figures Of Myth And Legend III: Magic And Marvels Credits: 3.00
- ENGL 22300 - Literature And Technology Credits: 3.00
- ENGL 22400 - Literature, Money, And Markets Credits: 3.00
- ENGL 22500 - Literature, Inequality, And Injustice Credits: 3.00
- ENGL 22600 - Narrative Medicine Credits: 3.00
- ENGL 22800 - Language And Social Identity Credits: 3.00
- ENGL 23000 - Great Narrative Works Credits: 3.00
- ENGL 23100 - Introduction To Literature Credits: 3.00
- ENGL 23200 - Thematic Studies In Literature Credits: 3.00 Arab Women Writers, Arab-American Literature, Arabic Culture, Arabic Lit In Translation, ArthurianLiterature: Medieval to Mod, Contemporary Foreign Women Writers, Dragons, German Folk & Fairy Tales, Intro to Islamic Civ & Cul, Italian WomenWriters in Translation, Math, Science, & Literature, Nature in German Literature, Pirates!, Span Am Lit in Trans, The Novels of Stephen King, Tolkein,Vikings!, Women Writers in Translation, Interpreting the Play Script, Sports & Literature, Russian and Slavic Fairy Tales, Intro to DisabilityStudies, North African Lit & Culture, The Tragic Vision
- ENGL 23400 - Literature And The Environment Credits: 3.00
- ENGL 23700 - Introduction To Poetry Credits: 3.00
- ENGL 23800 - Introduction To Fiction Credits: 3.00
- ENGL 24000 - British Literature Before 1789 Credits: 3.00
- ENGL 24100 - British Literature After 1789 Credits: 3.00
- ENGL 24900 - Great British Books Credits: 3.00
- ENGL 25000 - Great American Books Credits: 3.00
- ENGL 25700 - Literature Of Black America Credits: 3.00
- ENGL 26200 - Greek And Roman Classics In Translation Credits: 3.00
- ENGL 26400 - The Bible As Literature Credits: 3.00
- ENGL 26600 - World Literature: From The Beginnings To 1700 A.D. Credits: 3.00
• ENGL 26700 - World Literature: From 1700 A.D. To The Present Credits: 3.00
• ENGL 27600 - Shakespeare On Film Credits: 3.00
• ENGL 27900 - The American Short Story In Print And Film Credits: 3.00
• ENGL 28000 - Games, Narrative, Culture Credits: 3.00
• ENGL 28600 - The Movies Credits: 3.00
• ENGL 32200 - Word, Image, Media Credits: 3.00
• ENGL 33000 - Games And Diversity Credits: 3.00
• ENGL 33100 - Medieval English Literature Credits: 3.00
• ENGL 34200 - Legal Fictions Credits: 3.00
• ENGL 34300 - Labor And Literature Credits: 3.00
• ENGL 34400 - Environmental Ethics, Policy, And Sustainability Credits: 3.00
• ENGL 34500 - Games And World Building Credits: 3.00
• ENGL 35000 - American Literature Before 1865 Credits: 3.00
• ENGL 35100 - American Literature After 1865 Credits: 3.00
• ENGL 35200 - Native American Literature Credits: 3.00
• ENGL 35400 - Asian American Literature Credits: 3.00
• ENGL 35800 - Black Drama Credits: 3.00
• ENGL 35900 - Black Women Writers Credits: 3.00
• ENGL 36000 - Gender And Literature Credits: 3.00
• ENGL 36500 - Literature And Imperialism Credits: 3.00
• ENGL 36600 - Postcolonial Literatures Credits: 3.00
• ENGL 36700 - Mystery And Detective Fiction Credits: 3.00
• ENGL 37300 - Science Fiction And Fantasy Credits: 3.00
• ENGL 37700 - Modern And Contemporary Poetry Credits: 3.00
• ENGL 37900 - The Short Story Credits: 3.00
• ENGL 38000 - Issues In Rhetoric And Public Life Credits: 3.00
• ENGL 38100 - The British Novel Credits: 3.00
• ENGL 38200 - The American Novel Credits: 3.00
• ENGL 38600 - History Of Film To 1950 Credits: 3.00
• ENGL 38700 - History Of Film Since 1950 Credits: 3.00
• ENGL 38900 - Literature For Children Credits: 3.00
• ENGL 39200 - Young Adult Literature Credits: 3.00
• ENGL 39300 - Interdisciplinary Approaches To Environmental And Sustainability Studies Credits: 3.00
• ENGL 39600 - Studies In Literature And Language Credits: 1.00 to 3.00 African-American Protest Lit, Bad Film, Film Noir, Games, Narrative, & Culture, Latina/o Literature,Latina/o of the US, Living History, Maghrebi Literature & Culture, Spirit of Italian Comedy, Theories of Global Studies, Intro to Disability Studies, Games & Narrative, Games & World Building, Women & Games: Design Dev & Play, International Cinema, Language & Humor, Cinematic Shakespeare, Post SoulBlack Lit Post 1960, Teaching for Social Justice
• ENGL 41100 - Studies In Major Authors Credits: 3.00 Hurston, Herman Melville, Jane Austen, Mark Twain, Octavia Butler, Tolkein, Toni Morrison, Virginia Woolf, W.E.B. Du Bois, William Faulkner, Zora Neale Hurston, Chaucer, Chaucer and Subjectivity; Be Yourself, But Also Don't
• ENGL 41200 - Studies In Genre Credits: 3.00 Literary Modernism, American Women Poets, Black Satire and Humor, Black Speculative Fiction, The Literary Gothic, The Modern Novel, Twenty-First Century Novel, Twenty First Century Fiction, American Autobiography, American Short Story, Digital Humanities
ENGL 41300 - Studies In Literature And History Credits: 3.00 Florence & the Renaissance, Beowulf to Shakespeare, Children's Literature in Historical Perspective, Harlem Renaissance, History of the Book, Renaissance Mind: Florence 1250-1550, Studies in African Diaspora, Tudors in Literature & Film, Vikings and Literature, Tudors Queens in Lit & Film, Early American Networks, Lit in the Age of Eugenics, Gilded Age, The Heavens to Outer Space


ENGL 43900 - Topics In Disability Studies Credits: 3.00 Topics in Disability Studies: Bodies & Cultures, Disability in Fiction & Memoir, Eugenics Then & Now, Lit in the Age of Eugenics, Topics in Disability Studies

ENGL 44100 - Chaucer's Canterbury Tales Credits: 3.00

ENGL 44200 - Shakespeare Credits: 3.00

ENGL 46000 - Studies In Women's Literature Credits: 3.00

ENGL 46200 - The Bible As Literature: The Old Testament Credits: 3.00

ENGL 46300 - The Bible As Literature: The New Testament Credits: 3.00

ENGL 46500 - Gothic Literature Credits: 3.00

ENGL 52800 - Medieval English Literature Credits: 3.00

ENGL 53100 - The Rise Of The Novel Credits: 3.00

ENGL 53200 - The English Novel In The Nineteenth Century Credits: 3.00

ENGL 53400 - Seventeenth-Century Literature Credits: 3.00

ENGL 53500 - Restoration And Early Eighteenth-Century Literature Credits: 3.00

ENGL 53800 - English Drama From The Restoration To The Modern Period Credits: 3.00

ENGL 54100 - Studies In Chaucer's Canterbury Tales Credits: 3.00

ENGL 54300 - Shakespeare In Critical Perspective Credits: 3.00

ENGL 54400 - Milton Credits: 3.00

ENGL 54700 - British Romanticism Credits: 3.00

ENGL 54800 - Victorian Literature Credits: 3.00

ENGL 55200 - Studies In Major American Authors Credits: 3.00 Toni Morrison & Louise Erdrich

ENGL 55300 - Colonial And Early American Literature Credits: 3.00

ENGL 55400 - American Literary Culture 1820-1860 Credits: 3.00

ENGL 55700 - Nineteenth-Century African-American Narrative Credits: 3.00

ENGL 55800 - American Literature In The Later Nineteenth Century Credits: 3.00

ENGL 56000 - Modern American Poetry Credits: 3.00

ENGL 57300 - Tragedy Credits: 3.00

ENGL 57900 - Modern British Fiction Credits: 3.00

ENGL 58300 - U S Ethnic/Multicultural Literature Credits: 3.00

ENGL 59200 - Postcolonial Studies Credits: 3.00

ENGL 59300 - Contemporary British Fiction Credits: 3.00

ENGL 59400 - Contemporary Poetry Credits: 3.00

ENGL 59500 - Contemporary American Fiction Credits: 3.00

ENGL 59600 - Advanced Studies In Literature Or Language Credits: 3.00 Bad Film, Environmental Ethics, Games & UX, Games, Narrative, & Culture, History of Alt Film Making, Modern Arab Thought, Mod Euro Rhetoric, Poetics, Narrative, Postculturalism, Stephen King's Short Stories, The Continental Novel, Women's & Games: Design Dev & Play, Young Adult Literature, Tragedy & Phil, Writing the Divine, Magic & Realism, Revolutionary Poetics, Philosophy & Lit Theory, American Poetry's Great Debuts, Early American Networks, Literature for Children

ENGL 59700 - Contemporary Black Feminist Literature Credits: 3.00
Entrepreneurship (ENTR)

- ENTR 20000 - Introduction To Entrepreneurship And Innovation Credits: 3.00
- ENTR 31000 - Marketing And Management For New Ventures Credits: 3.00
- ENTR 47000 - Gender, Diversity And Leadership Credits: 3.00

French (FR)

- FR 24100 - Introduction To The Study Of French Literature Credits: 3.00
- FR 33000 - French Cinema Credits: 3.00
- FR 34100 - French Literature I: From The Middle Ages To The Enlightenment Credits: 3.00
- FR 34200 - French Literature II: The 19th And 20th Centuries Credits: 3.00
- FR 38000 - Special Topics In French Culture And Civilization Credits: 3.00 French Food Culture, Special Topics in French Culture and Civilization: La Gastronomie, Sport/Spectacle Berlin/Paris
- FR 39400 - Special Topics In French Literature Credits: 3.00 French Caribbean Literatures, Out of Africa
- FR 44300 - Introduction To Francophone Literature Credits: 3.00
- FR 48000 - French Civilization Credits: 3.00
- FR 54100 - Renaissance French Literature Credits: 3.00
- FR 54900 - French Literature And Film Credits: 3.00
- FR 55800 - French Novel Of The Twentieth Century Credits: 3.00
- FR 58100 - French Culture Credits: 3.00
- FR 58200 - Francophone Cultures Credits: 3.00
- FR 59400 - Special Topics In French Literature Credits: 1.00 to 4.00 Conte Francais, Introduction to Francophone Literature, Litterature Quebecoise, The Continental Novel, Contemporary Fiction, French Caribbean Literature

Food Science (FS)

- FS 47000 - Wine Appreciation Credits: 3.00

Film and Video Studies (FVS)

- FLM 49100 - Special Topics In Film/Video Studies Credits: 1.00 to 4.00 Films of Martin Scorcese, Jewish Cinema, Mafia and The Movies, Terrorism & The Movies, Cinematic Shakespeare, Feminist Prsp on Film & Camera, Post-Soviet Russian Cinema, Spirit of Ital Comedy

German (GER)

- GER 23000 - German Literature In Translation Credits: 3.00 German Fairy Tales, German Folk & Fairy Tales, Myth, Legend, & Folklore, Myths & Legends: Elves to Elvis, Nature and the Environment in German Literature and Thought, Nature in German Literature, Supernatural & Uncanny Ger Lit, Vikings, Monsters, Grimm & God, A Brief History or Doom, German Lit in Translation (select courses satisfy Humanities for core)
- GER 24100 - Introduction To The Study Of German Literature Credits: 3.00
- GER 28000 - German Special Topics Credits: 3.00 Beer and Brewing in German Culture
- GER 33000 - German Cinema Credits: 3.00 (satisfies Human Cultures Humanities for core)
- GER 34100 - German Literature I: From The Middle Ages To The 18th Century Credits: 3.00
- GER 34200 - German Literature II: From The 18th Century To The 21st Century Credits: 3.00
• GER 48000 - German Civilization Credits: 3.00
• GER 49800 - Advanced Topics In German Credits: 3.00 The Cultures of Fascism
• GER 54400 - German Romanticism Credits: 3.00
• GER 54500 - German Prose From Naturalism To The Present Credits: 3.00
• GER 55100 - Lyric Poetry From Romanticism To The Present Credits: 3.00
• GER 55400 - German Drama Before Naturalism Credits: 3.00
• GER 55500 - German Drama From Naturalism To The Present Credits: 3.00
• GER 58100 - German Culture Credits: 3.00
• GER 59400 - Special Topics In German Literature Credits: 1.00 to 4.00 Nietzsche: Literature & Values, Orientalism in German Literature, The Continental Novel, German Novelle

Global Studies Liberal Arts (GSLA)

• GSLA 10100 - Global Awareness Credits: 3.00

Human Development and Family Sciences (HDFS)

• HDFS 21000 - Introduction To Human Development Credits: 3.00
• HDFS 33000 - Sexuality And Family Life Credits: 3.00

Hebrew (HEBR)

• HEBR 28400 - Ancient Near Eastern History And Culture Credits: 3.00
• HEBR 38000 - Israel And The Modern World: Cinema, Literature, History And Politics Credits: 3.00

History (HIST)

• HIST 10300 - Introduction To The Medieval World Credits: 3.00
• HIST 10400 - Introduction To The Modern World Credits: 3.00
• HIST 10500 - Survey Of Global History Credits: 3.00
• HIST 15100 - American History To 1877 Credits: 3.00
• HIST 15200 - United States Since 1877 Credits: 3.00
• HIST 20100 - Special Topics In History Credits: 3.00 Ancient Judaism & Early Christianity, Ancient Near Eastern History & Culture, History of Globalization, History of the Military Art
• HIST 21000 - The Making Of Modern Africa Credits: 3.00
• HIST 21100 - The Global Field: World Soccer And Global History Credits: 3.00
• HIST 22100 - History Behind The Headlines Credits: 3.00
• HIST 22800 - English History To 1688 Credits: 3.00
• HIST 23005 - Hitler's Europe Credits: 3.00
• HIST 23800 - History Of Russia From Medieval Times To 1861 Credits: 3.00
• HIST 23900 - History Of Russia From 1861 To The Present Credits: 3.00
• HIST 24000 - East Asia And Its Historic Tradition Credits: 3.00
• HIST 24100 - East Asia In The Modern World Credits: 3.00
• HIST 24300 - South Asian History And Civilizations Credits: 3.00
• HIST 24600 - Modern Middle East And North Africa Credits: 3.00
• HIST 25000 - United States Relations With The Middle East And North Africa Credits: 3.00
• HIST 27100 - Introduction To Colonial Latin American History (1492-1810) Credits: 3.00
• HIST 27200 - Introduction To Modern Latin American History (1810 To The Present) Credits: 3.00
• HIST 27800 - Money, Trade, And Power: The History Of Capitalism Credits: 3.00
• HIST 30000 - Eve Of Destruction: Global Crises And World Organization In The 20th Century Credits: 3.00
• HIST 30305 - Food In Modern America Credits: 3.00
• HIST 30400 - America In The 1960s Credits: 3.00
• HIST 30505 - The United States In The World 1898-Present Credits: 3.00
• HIST 30605 - Technology And War In U.S. History Credits: 3.00
• HIST 31005 - The Civil War And Reconstruction, 1850 To 1877 Credits: 3.00
• HIST 31205 - The Arab-Israeli Conflict Credits: 3.00
• HIST 31305 - Medical Devices And Innovation Credits: 3.00
• HIST 31405 - Science, Technology, Engineering And Mathematics (STEM) And Gender Credits: 3.00
• HIST 31505 - American Beauty Credits: 3.00
• HIST 31700 - A History Of The Christian Church And The Expansion Of Christianity I Credits: 3.00
• HIST 31905 - Christianity In The Global Age Credits: 3.00
• HIST 32105 - Spain: The First Global Empire, 1469-1713 Credits: 3.00
• HIST 32300 - German History Credits: 3.00
• HIST 32400 - Modern France Credits: 3.00
• HIST 32501 - Twentieth Century Europe Through Autobiography Credits: 3.00
• HIST 32900 - History Of Women In Modern Europe Credits: 3.00
• HIST 33205 - The Nuclear Age Credits: 3.00
• HIST 33300 - Science And Society In Western Civilization I Credits: 3.00
• HIST 33400 - Science And Society In Western Civilization II Credits: 3.00
• HIST 33505 - Nationalism And Socialism In East Central Europe Credits: 3.00
• HIST 33700 - Europe Since 1945 Credits: 3.00
• HIST 33805 - History Of Human Rights Credits: 3.00
• HIST 33900 - Traditional China Credits: 3.00
• HIST 34000 - Modern China Credits: 3.00
• HIST 34300 - Traditional Japan Credits: 3.00
• HIST 34400 - History Of Modern Japan Credits: 3.00
• HIST 34505 - Arabs in American Eyes Credits: 3.00
• HIST 34705 - History Of Religion In America Credits: 3.00
• HIST 34901 - The First World War Credits: 3.00
• HIST 35000 - Science And Society In The Twentieth Century World Credits: 3.00
• HIST 35100 - The Second World War Credits: 3.00
• HIST 35205 - Death, Disease And Medicine In Twentieth Century American History Credits: 3.00
• HIST 35305 - Sports In America Credits: 3.00
• HIST 35400 - Women In America To 1870 Credits: 3.00
• HIST 35500 - History Of American Military Affairs Credits: 3.00
• HIST 35900 - Gender In East Asian History Credits: 3.00
• HIST 36305 - The History Of Medicine And Public Health Credits: 3.00
• HIST 36600 - Hispanic Heritage Of The United States Credits: 3.00
• HIST 37005 - Queens And Empresses In Early Modern Europe Credits: 3.00
• HIST 37100 - Society, Culture, And Rock And Roll Credits: 3.00
• HIST 37200 - History Of The American West Credits: 3.00
• HIST 37500 - Women In America Since 1870 Credits: 3.00
• HIST 37600 - History Of Indiana Credits: 3.00
• HIST 37700 - History And Culture Of Native America Credits: 3.00
• HIST 38001 - History Of United States Agriculture Credits: 3.00
• HIST 38200 - American Constitutional History Credits: 3.00
• HIST 38300 - Recent American Constitutional History Credits: 3.00
• HIST 38400 - History Of Aviation Credits: 3.00
• HIST 38505 - Media, Politics And Popular Culture Credits: 3.00
• HIST 38605 - Land Of The Indians: Native Americans In Indiana Credits: 3.00
• HIST 38700 - History Of The Space Age Credits: 3.00
• HIST 39400 - Environmental History Of The United States Credits: 3.00
• HIST 39600 - African American History To 1877 Credits: 3.00
• HIST 39800 - African American History Since 1877 Credits: 3.00
• HIST 40000 - Great Books And The Search For Meaning Credits: 3.00
• HIST 40300 - Europe In The Reformation Credits: 3.00
• HIST 40500 - The French Revolution And Napoleon Credits: 3.00
• HIST 40600 - Rebels And Romantics: Europe 1815-1870 Credits: 3.00
• HIST 40700 - Road To World War I: Europe 1870-1919 Credits: 3.00
• HIST 40800 - Dictatorship And Democracy: Europe 1919-1945 Credits: 3.00
• HIST 41005 - History Of The American Presidency Credits: 3.00
• HIST 41300 - Modern European Imperialism: Repression And Resistance Credits: 3.00
• HIST 41505 - Gender And Politics In Early Modern Europe Credits: 3.00
- **HIST 42300 - Advanced Topics In Modern Germany** Credits: 3.00 Divided Germany, German Business History, Germany & France: War, Peace & Memory
- **HIST 43900 - Communist China** Credits: 3.00
- **HIST 44100 - Africa In The Twentieth Century** Credits: 3.00
- **HIST 46000 - American Colonial History** Credits: 3.00
- **HIST 46100 - The Revolutionary Era, 1763 To 1800** Credits: 3.00
- **HIST 46700 - The Emergence Of Modern America** Credits: 3.00
- **HIST 46800 - Recent American History** Credits: 3.00
- **HIST 46900 - Black Civil Rights Movement** Credits: 3.00
- **HIST 47005 - Women And Health In America** Credits: 3.00
- **HIST 47300 - History Of The South** Credits: 3.00
- **HIST 47600 - The Civil War In Myth And Memory** Credits: 3.00
- **HIST 47700 - Native American Women's History** Credits: 3.00
- **HIST 48005 - Madness And The Asylum In The United States** Credits: 3.00
- **HIST 48500 - Topics In American Political History** Credits: 3.00 History of Pres Comm, The American Presidency, Work & Labor in Modern America
- **HIST 48800 - History Of Sexual Regulation In The United States** Credits: 3.00
- **HIST 49400 - Science And Society In American Civilization** Credits: 3.00
- **HIST 49500 - Research Seminar In Historical Topics** Credits: 3.00 1960s America, American Foreign Relations, American Imperialism, American Missionaries in East Asia, Autobiographies & Memoirs, Chilies to Chocolate: How the Americans Changed the World, Com at the Dawn of the Republic, Flight and Space, Gender Revolution in Modern American, History of Madness and the Asylum, Indian Removal 19th Cent US, Interwar Jewish Experiences in E. Central Europe, Russia, and Middle East, Madness and the Asylum, Modern Civil Rights Movement, Native America and Colonial Settlement, Persistent Myths in Amer Hist, Pol & Popular Music: 1945-1969, Politics & Popular Culture of Cold War America-Honors, Rel & Pol In Mid Amer, Sectional Crisis And American Civil War, Seminar on Native America, Spain in American Southwest, The Age of Elvis: America in the 1950’s, Trials and History, War and Gender, Witchcraft & Magic, Women Modern America 1950-Pres, Medicine and Madness, Rights & Revolution Eur & America, Race & Civil Rights Movmnt, Psychedlic Psychiatry, Modern US Protest Movements, Native American History, Decolonization and After, Famine in World History, Gender and War, World War I in the Middle East, Race & Modern Civil Rights, Writing the Age of Revolutions
- **HIST 51200 - England Under The Stuarts** Credits: 3.00
- **HIST 57600 - Problems In Latin American History** Credits: 3.00
- **HIST 59500 - The Holocaust And Genocide** Credits: 3.00

**Honors (HONR)**

- **HONR 19900 - Interdisciplinary Honors - Introductory Seminar** Credits: 1.00 to 6.00 Beyond Afghanistan
- **HONR 29900 - Interdisciplinary Honors - Experiential Learning** Credits: 1.00 to 6.00 Underground Networks
- **HONR 39900 - Interdisciplinary Honors - Special Topics Seminar** Credits: 1.00 to 6.00 Human Redesign Calendar, Beyond Afghanistan
- **HONR 46000 - Technological Justice** Credits: 3.00

**Interdisciplinary Studies (IDIS)**
• IDIS 49100 - Special Topics In Interdisciplinary Studies Credits: 1.00 to 4.00 Arab Women Writers, Arabic Culture, British Literature, Cultural Encounters, Cultural Orphans in Latin America, Evolutn of Bible Revol Effects, Gender & Medieval Religion, Ghosts in Global Culture, Intro to Islamic Civ & Cul, Jewish Cinema, Milton, Muslim Women in History, Muslims in America, Myth, Legend, & Folklore, Myths & Legends: Elves to Elvis, Race & Religion in the US, Religion & Violence, The Icelandic Saga, Two Koreas: Pol Econ Rivalry, Women Writers in Translat, Intro to Global Urban Environmnt, German Literature in Translation

• IDIS 59100 - Selected Topics In Interdisciplinary Studies Credits: 3.00 Seventeenth Century Lit, The Continental Novel, Bible & Early Inerpret

Information & Library Science (ILS)

• ILS 23000 - Data Science And Society: Ethical Legal Social Issues Credits: 3.00

Italian (ITAL)

• ITAL 23100 - Dante's Divine Comedy Credits: 3.00
• ITAL 28100 - The Italian Renaissance And Its Scientific And Cultural Impact On Western Civilization Credits: 3.00
• ITAL 33000 - The Italian Cinema Credits: 3.00
• ITAL 33300 - The Spirit Of Italian Comedy Credits: 3.00
• ITAL 33500 - Italian-American Cinema Credits: 3.00
• ITAL 34100 - Italian Literature I: From The Middle Ages To The Enlightenment Credits: 3.00
• ITAL 34200 - Italian Literature II: From Romanticism To The Present Credits: 3.00
• ITAL 39300 - Special Topics In Italian Literature Or Cinema Credits: 3.00 Italian Fashion: History, Italian Women Writers in Translation, La Dolce Vita: Italian Food, Mafia and The Movies, The Films of Martin Scorcese, The Cultures of Fascim
• ITAL 49300 - Advanced Topics In Italian Literature Or Cinema Credits: 3.00 Mafia & the Movies

Japanese (JPNS)

• JPNS 24100 - Introduction To The Study Of Japanese Literature Credits: 3.00
• JPNS 28000 - Introduction To Modern Japanese Civilization Credits: 3.00
• JPNS 33000 - Japanese Cinema Credits: 3.00
• JPNS 34100 - Japanese Literature I: Modern Japanese Literature Credits: 3.00
• JPNS 36300 - Relationship Of Japanese Language And Society Credits: 3.00
• JPNS 48500 - Culinary Culture Of Japan Credits: 3.00
• JPNS 49000 - Special Topics In Japanese Language Credits: 1.00 to 3.00 Contemporary Japanese Popular Literature & Culture, Japanese Culinary Culture, JPNS B Movies Document Films, JPNS Cinema II: Enter & Othr Fm, Modern JPNS Masterpiece Novels, Japanese Visual Culture, Japanese Songs, Japanese Society Through Songs
• JPNS 59400 - Special Topics In Japanese Literature Credits: 1.00 to 4.00 Contemp JPNS Women Writers, Modern Japanese Fiction, The Continental Novel

Jewish Studies (JWST)

• JWST 33000 - Introduction To Jewish Studies Credits: 3.00

Korean (KOR)
• KOR 33000 - Introduction To Korean Cinema Credits: 3.00
• KOR 38000 - Special Topics In Korean Culture Credits: 3.00 Dating, Sex & Marriage - Korea
• KOR 48000 - Special Topics In Korean Studies Credits: 3.00 Kpop:Gen, Iden, Indus & Fan

Latina & Latino Studies (LALS)

• LALS 25000 - Introduction To Latin American And Latino Studies Credits: 3.00
• LALS 26000 - U S Latino Culture Credits: 3.00
• LALS 30100 - Latin American Literary And Cultural Studies Credits: 3.00 Hispanic Lit I
• LALS 40100 - Special Topics In Latin American/Latino Studies Credits: 3.00 Latin American Culture, Latina Feminisms

Latin (LATN)

• LATN 34300 - Roman Oratory Credits: 3.00
• LATN 34400 - Roman Epic Credits: 3.00
• LATN 34500 - Roman Elegy Credits: 3.00
• LATN 34700 - Roman Comedy Credits: 3.00
• LATN 44200 - Roman Lyric Poetry Credits: 3.00
• LATN 44300 - Roman Satire Credits: 3.00
• LATN 44400 - Roman Philosophers Credits: 3.00
• LATN 44600 - Roman Historians Credits: 3.00
• LATN 49000 - Directed Reading In Latin Credits: 1.00 to 3.00 Latin Paleography
• LATN 59000 - Directed Reading In Latin Credits: 1.00 to 4.00 Latin Paleography

Languages and Cultures (LC)

• LC 23000 - Crossing Borders: Introduction To Comparative Literature Credits: 3.00 Intro to Islami Civ & Cul, Introduction To Comparative Literature, World Lit 1700 to Now
• LC 23100 - Fairytale, Folktales, Fable Credits: 3.00
• LC 23500 - East Asian Literature In Translation Credits: 3.00
• LC 23700 - Our Common Bond: Languages And Cultures In A Global Context Credits: 3.00
• LC 23900 - Women Writers In Translation Credits: 3.00 Women Writers in Translation, Contemporary Foreign Women Writers in Translation, French Women Writers in Translation - Honors, Italian Women Writers in Translation(select courses satisfy Human Cultures Humanities for core)
• LC 33100 - Comparative Literature In Translation Credits: 3.00 Kabbalah and Jewish Mysticism, Topics in Brazilian Culture
• LC 33300 - The Middle Ages On Film Credits: 3.00
• LC 33800 - Language Through Films Credits: 3.00
• LC 49000 - Special Topics In Foreign Languages And Literatures Credits: 1.00 to 4.00 History of Chinese Art, Jewish Cinema, Leo Tolstoy His World and Art, Terrorism & The Movies, BTS and Kpop Culture, Bible & Early Interp, The Cultures of Facism, The Hispanic World, Cold War Cultures in Korea, Tolstoy and His Age
• LC 59300 - Special Topics In Literature Credits: 1.00 to 4.00 Dostoevsky and His Age, Leo Tolstoy His World and Art, Mod Europ Narrativ Theory Pract, Modern Arab Thought, ModEuroRhetore,Poetics,Narrativ, Nietzsche: Literature & Values, Stephen King’s Short Stories, The Continental Novel, The Icelandic Saga, Theory of Creativity, Approaches to Narrative, Don Quixote and Cervantes, Borders and Borderlands, Tolstoy and His World
Medieval & Renaissance Studies (MARS)

- MARS 22000 - Introduction To Medieval And Renaissance Studies Credits: 3.00 Dragons, Arthurian Literature: Medieval to Modern, Love, Sex, and Gender in Western European Literature, Middle Ages on Film, Pirates!, The Tudors, Vikings!
- MARS 42000 - Medieval And Renaissance Studies Seminar Credits: 3.00 Beowulf to Shakespeare, Chaucer’s Troilus, Renaissance Mind: Florence 1300-1600, The Bible as Literature: The New Testament, Tudors in Literature and Film

Management (MGMT)

- MGMT 20000 - Introductory Accounting Credits: 3.00
- MGMT 21200 - Business Accounting Credits: 3.00
- MGMT 24200 - Contemporary Problems In Personal Finance For Minorities Credits: 3.00
- MGMT 24300 - Contemporary Thought Of Minorities In Management Credits: 3.00
- MGMT 32300 - Principles Of Marketing Credits: 3.00
- MGMT 32400 - Marketing Management Credits: 3.00
- MGMT 45500 - Legal Background For Business I Credits: 3.00

Music History & Theory (MUS)

- MUS 13200 - Music Theory I Credits: 3.00
- MUS 13300 - Music Theory II Credits: 3.00
- MUS 23200 - Music Theory III Credits: 3.00
- MUS 25000 - Music Appreciation Credits: 3.00
- MUS 37500 - Selected Topics In Music Credits: 3.00 Beethoven, Brahms, Celebratory Baroque Music, Mozart, The Music of Handel, World Music
- MUS 37600 - World Music Credits: 3.00
- MUS 37800 - Jazz History Credits: 3.00
- MUS 38100 - Music History I: Antiquity To Mozart Credits: 3.00
- MUS 38200 - Music History II: Beethoven To The Present Credits: 3.00
- MUS 49000 - Guided Reading In Music Credits: 1.00 to 6.00 History of Rock Music

Naval Science (NS)

- NS 21300 - Sea Power And Maritime Affairs Credits: 3.00
- NS 33000 - Evolution Of Warfare Credits: 3.00
- NS 41300 - Naval Leadership And Ethics Credits: 3.00

Organizational Behavior & Human Resources (OBHR)

- OBHR 33000 - Introduction To Organizational Behavior Credits: 3.00

Philosophy (PHIL)

- PHIL 11000 - The Big Questions: Introduction To Philosophy Credits: 3.00
• PHIL 11005 - I Play, Therefore I Am: Introduction To Philosophy Through Video Games Credits: 4.00
• PHIL 11100 - Introduction To Ethics Credits: 3.00
• PHIL 11400 - Global Moral Issues Credits: 3.00
• PHIL 12000 - Critical Thinking Credits: 3.00
• PHIL 20600 - Introduction To Philosophy Of Religion Credits: 3.00
• PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00
• PHIL 20800 - Ethics Of Data Science Credits: 3.00
• PHIL 21900 - Philosophy And The Meaning Of Life Credits: 3.00
• PHIL 22100 - Introduction To Philosophy Of Science Credits: 3.00
• PHIL 22300 - Fate And Free Will Credits: 3.00
• PHIL 22500 - Philosophy And Gender Credits: 3.00
• PHIL 22700 - Science And Religion Credits: 3.00
• PHIL 23000 - Religions Of The East Credits: 3.00
• PHIL 23100 - Religions Of The West Credits: 3.00
• PHIL 24000 - Social And Political Philosophy Credits: 3.00
• PHIL 24200 - Philosophy, Culture, And The African American Experience Credits: 3.00
• PHIL 26000 - Philosophy And Law Credits: 3.00
• PHIL 27000 - Biomedical Ethics Credits: 3.00
• PHIL 27500 - The Philosophy Of Art Credits: 3.00
• PHIL 28000 - Ethics And Animals Credits: 3.00
• PHIL 29000 - Environmental Ethics Credits: 3.00
• PHIL 29300 - Selected Topics In Philosophy Credits: 1.00 to 3.00 Global Ethics, Philosophy of Disability, Science and Religion
• PHIL 30100 - History Of Ancient Philosophy Credits: 3.00
• PHIL 30200 - History Of Medieval Philosophy Credits: 3.00
• PHIL 30300 - History Of Modern Philosophy Credits: 3.00
• PHIL 30400 - Nineteenth-Century Philosophy Credits: 3.00
• PHIL 30600 - Twentieth-Century Philosophy Credits: 3.00
• PHIL 32200 - Philosophy Of Technology Credits: 3.00
• PHIL 40200 - Studies In Medieval Christian Thought Credits: 3.00
• PHIL 40300 - Moral Psychology And Climate Change Credits: 3.00
• PHIL 40600 - Intermediate Philosophy Of Religion Credits: 3.00
• PHIL 41100 - Modern Ethical Theories Credits: 3.00
• PHIL 42100 - Philosophy Of Science Credits: 3.00
• PHIL 42400 - Recent Ethical Theory Credits: 3.00
• PHIL 42500 - Metaphysics Credits: 3.00
• PHIL 43200 - Theory Of Knowledge Credits: 3.00
• PHIL 43500 - Philosophy Of Mind Credits: 3.00
• PHIL 46500 - Philosophy Of Language Credits: 3.00
• PHIL 49000 - Advanced Topics In Philosophy Credits: 1.00 to 3.00 Early Greek Philosophy, Ethics and Philosophy of Info, Minds and Morals, Personal Identity, Moral Psych & Environment, Philosophy of Race
• PHIL 50100 - Studies In Greek Philosophy Credits: 3.00
• PHIL 50200 - Studies In Medieval Philosophy Credits: 3.00
• PHIL 50300 - Studies In Early Modern Philosophy Credits: 3.00
• PHIL 50500 - Islamic And Jewish Philosophy And The Classical Tradition Credits: 3.00
• PHIL 50600 - Advanced Philosophy Of Religion Credits: 3.00
• PHIL 50700 - Recent American Philosophy Credits: 3.00
• PHIL 51000 - Phenomenology Credits: 3.00
• PHIL 51400 - Twentieth-Century Analytical Philosophy I Credits: 3.00
• PHIL 51500 - Twentieth-Century Analytical Philosophy II Credits: 3.00
• PHIL 52000 - Existentialism Credits: 3.00
• PHIL 52400 - Contemporary Ethical Theory Credits: 3.00
• PHIL 52500 - Studies In Metaphysics Credits: 3.00
• PHIL 53000 - Deconstructionist And Postmodernist Philosophy Credits: 3.00
• PHIL 53200 - Studies In Theory Of Knowledge Credits: 3.00
• PHIL 53500 - Studies In Philosophy Of Mind Credits: 3.00
• PHIL 54000 - Studies In Social And Political Philosophy Credits: 3.00
• PHIL 54500 - Recent Analytic Philosophy Credits: 3.00
• PHIL 55100 - Philosophy Of The Natural Sciences Credits: 3.00
• PHIL 55200 - Philosophy Of The Social Sciences Credits: 3.00
• PHIL 55500 - Critical Theory Credits: 3.00
• PHIL 56200 - Reading To Argue Credits: 3.00

Pharmacy Practice (PHPR)

• PHPR 49000 - Special Topics Credits: 1.00 to 3.00 Traditnl Chns Med In Shanghai

Political Science (POL)

• POL 10100 - American Government And Politics Credits: 3.00
• POL 12000 - Introduction To Public Policy And Public Administration Credits: 3.00
• POL 13000 - Introduction To International Relations Credits: 3.00
• POL 14100 - Governments Of The World Credits: 3.00
• POL 15000 - Introduction To Political Thought Credits: 3.00
• POL 20000 - Introduction To The Study Of Political Science Credits: 3.00
• POL 22200 - Women, Politics, And Public Policy Credits: 3.00
• POL 22300 - Introduction To Environmental Policy Credits: 3.00
• POL 22800 - Data Science And Public Policy Credits: 3.00
• POL 22900 - Emerging Problems In Political Science Credits: 1.00 to 3.00 Global Habitats, Cmnty Dev & Sust, Terrorism, The US, Cuba & Latin America, Social and Political Philosophy, State Borders and Disputes, Data Science and Public Policy, Spies and Lies
• POL 23000 - Introduction To Peace Science Credits: 3.00
• POL 23100 - Introduction To United States Foreign Policy Credits: 3.00
• POL 23400 - The Politics Of Terrorism Credits: 3.00
• POL 23500 - International Relations Among Rich And Poor Nations Credits: 3.00
• POL 23700 - Modern Weapons And International Relations Credits: 3.00
• POL 30000 - Introduction To Political Analysis Credits: 3.00
• POL 31400 - The President And Policy Process Credits: 3.00
• POL 32300 - Comparative Environmental Policy Credits: 3.00
• POL 32600 - Black Political Participation In America Credits: 3.00
• POL 32700 - Global Green Politics Credits: 3.00
• POL 33500 - China And The Challenges Of Globalization Credits: 3.00
• POL 34500 - West European Democracies In The Post-Industrial Era Credits: 3.00
• POL 34700 - Introduction To Latin American Politics Credits: 3.00
• POL 34800 - East Asian Politics Credits: 3.00
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• POL 59000 - Directed Reading In Political Science Credits: 1.00 to 3.00 Holocaust and Genocide

Psychological Sciences (PSY)

• PSY 12000 - Elementary Psychology Credits: 3.00
• PSY 12300 - Beyond Mental Health: The Science Of Well-Being Credits: 3.00
• PSY 20000 - Introduction To Cognitive Psychology Credits: 3.00
• PSY 22200 - Introduction To Behavioral Neuroscience Credits: 3.00
• PSY 23500 - Child Psychology Credits: 3.00
• PSY 23900 - The Psychology Of Women Credits: 3.00
• PSY 24000 - Introduction To Social Psychology Credits: 3.00
• PSY 24400 - Introduction To Human Sexuality Credits: 3.00
• PSY 27200 - Introduction To Industrial-Organizational Psychology Credits: 3.00
• PSY 29200 - Topics In Psychology Credits: 1.00 to 3.00 Intro to Clinical Psych, Intro to Neuropsychology, Neurobiology of Disease, Science of Well Being
• PSY 31000 - Sensory And Perceptual Processes Credits: 3.00
• PSY 31100 - Human Memory Credits: 3.00
• PSY 31400 - Introduction To Learning Credits: 3.00
• PSY 32400 - Introduction Cognitive Neuroscience Credits: 3.00
• PSY 32700 - Psychology Of Helping Credits: 3.00
• PSY 33500 - Stereotyping And Prejudice Credits: 3.00
• PSY 33600 - Issues In Developmental Psychology Credits: 3.00
• PSY 33700 - Social Cognition Credits: 3.00
• PSY 34200 - Introduction To Psychology Of Personality Credits: 3.00
• PSY 35000 - Abnormal Psychology Credits: 3.00
• PSY 35200 - Introduction To Neuropsychology Credits: 3.00
• PSY 35400 - Close Relationships Credits: 3.00
• PSY 36700 - Adult Development And Aging Credits: 3.00
• PSY 37600 - Attention And Cognitive Control Credits: 3.00
• PSY 38000 - Behavior Change Methods Credits: 3.00
• PSY 41800 - Understanding Autism Credits: 3.00
• PSY 42100 - Alcohol Use And Disorders Credits: 3.00
• PSY 42200 - Genes and Behavior Credits: 3.00
• PSY 42600 - Language Development Credits: 3.00
• PSY 42800 - Drugs And Behavior Credits: 3.00
• PSY 42900 - Hormones And Behavior Credits: 3.00
• PSY 43200 - Social Psychology In Film Credits: 3.00
• PSY 43600 - Foods And Behavior Credits: 3.00
• PSY 43800 - Introduction To Clinical Psychology Credits: 3.00
• PSY 44300 - Aggression And Violence Credits: 3.00
• PSY 46400 - Research Ethics In Psychological Sciences Credits: 3.00
• PSY 47300 - Selection And Performance Appraisal In Organizations Credits: 3.00
• PSY 47500 - Work Motivation And Job Satisfaction Credits: 3.00
• PSY 48400 - The Psychology Of Consciousness Credits: 3.00
• PSY 51500 - Neuroscience Of Consciousness Credits: 3.00
• PSY 59100 - Topics In Psychology Credits: 1.00 to 3.00

Portuguese (PTGS)

• PTGS 33000 - Brazilian, Portuguese, And African Cinema Credits: 3.00
• PTGS 55100 - Brazilian Poetry Credits: 3.00
• PTGS 55500 - Brazilian Drama Credits: 3.00
• PTGS 55700 - Brazilian Fiction Credits: 3.00
• PTGS 59400 - Special Topics In Luso-Brazilian Literature Credits: 1.00 to 4.00
  Latin American Short Story, Clarice Lispector, Luso-Brazilian Literature, Machado De Assis, Machado & Borges

Religious Studies (REL)

• REL 20000 - Introduction To The Study Of Religion Credits: 3.00
• REL 20100 - Interpretation Of The New Testament Credits: 3.00
• REL 20200 - Interpretation Of The Old Testament Credits: 3.00
• REL 20300 - Theology Of Paul Credits: 3.00
• REL 20400 - Introduction To Christian Theology Credits: 3.00
• REL 23000 - Religions Of The East Credits: 3.00
• REL 23100 - Religions Of The West Credits: 3.00
• REL 25000 - A History Of The Christian Afterlife Credits: 3.00
• REL 31700 - Ancient Judaism And Early Christianity Credits: 3.00
• REL 31800 - The Bible And Its Early Interpreters Credits: 3.00
• REL 35100 - Christian Mysticism Credits: 3.00
• REL 45000 - Christian Ethics Credits: 3.00
• REL 45100 - Christology Credits: 3.00
• REL 45200 - Systematic Theology Credits: 3.00
• REL 49100 - Special Topics In Religious Studies Credits: 3.00
  Rhetorics of Religion, Engaging Religious Diversity

Russian (RUSS)

• RUSS 29800 - Special Topics In Russian Credits: 3.00
  Russian Fairy Tales, Russian and Slavic Fairy Tales
• RUSS 33000 - Russian And East European Cinema Credits: 3.00
• RUSS 34100 - Russian Literature In The Nineteenth Century Credits: 3.00
• RUSS 34200 - Revolution, Repression, Renewal: Soviet Literature And Beyond Credits: 3.00
• RUSS 38000 - Russian Culture And Civilization I Credits: 3.00
• RUSS 38100 - Russian Culture And Civilization II Credits: 3.00
• RUSS 49700 - Topics In Russian Literature Credits: 3.00 to 6.00
  Dostoevsky and His Age, Tolstoy and His Age
RUSS 49800 - Topics In Russian Culture Credits: 3.00 to 6.00 Post-Soviet Russian Cinema, The Caucasus

Sociology (SOC)

- SOC 10000 - Introductory Sociology Credits: 3.00
- SOC 22000 - Social Problems Credits: 3.00
- SOC 27500 - Sociology Of Aging And The Life Course Credits: 3.00
- SOC 31000 - Race And Ethnicity Credits: 3.00
- SOC 32400 - Criminology Credits: 3.00
- SOC 32600 - Social Conflict And Criminal Justice Credits: 3.00
- SOC 32700 - Crime, Deviance And Mass Media Credits: 3.00
- SOC 32800 - Criminal Justice Credits: 3.00
- SOC 33400 - Urban Sociology Credits: 3.00
- SOC 33500 - Political Sociology Credits: 3.00
- SOC 33800 - Global Social Movements Credits: 3.00
- SOC 33900 - Sociology Of Global Development Credits: 3.00
- SOC 34000 - General Social Psychology Credits: 3.00
- SOC 34400 - Environmental Sociology Credits: 3.00
- SOC 35000 - Sociology Of Family Credits: 3.00
- SOC 35200 - Drugs, Culture, And Society Credits: 3.00
- SOC 35600 - Hate And Violence Credits: 3.00
- SOC 36700 - Religion In America Credits: 3.00
- SOC 36800 - The Social Significance Of Religion Credits: 3.00
- SOC 36900 - Religion And Chinese Society Credits: 3.00
- SOC 37400 - Medical Sociology Credits: 3.00
- SOC 38100 - Data And Society Credits: 3.00
- SOC 39100 - Selected Topics In Sociology Credits: 1.00 to 3.00 Sociology of Mental Health, Employment and Law, Sociology of Gaming, Sociology of Policing
- SOC 40200 - Sociological Theory Credits: 3.00
- SOC 40900 - Social Networks Credits: 3.00
- SOC 41100 - Social Inequality Credits: 3.00
- SOC 41900 - Sociology Of Law Credits: 3.00
- SOC 42100 - Juvenile Delinquency Credits: 3.00
- SOC 42600 - Social Deviance And Control Credits: 3.00
- SOC 42900 - Sociology Of Protest Credits: 3.00
- SOC 43200 - Work In Contemporary America Credits: 3.00
- SOC 45000 - Gender Roles In Modern Society Credits: 3.00
- SOC 46100 - Health And Social Behavior Credits: 3.00
- SOC 52500 - Social Movements Credits: 3.00
- SOC 53100 - Community Organization Credits: 3.00
- SOC 57000 - Sociology Of Education Credits: 3.00
- SOC 57200 - Comparative Healthcare Systems Credits: 3.00
- SOC 57300 - The Human Side Of Medicine Credits: 3.00
- SOC 57400 - The Social Organization Of Healthcare Credits: 3.00
- SOC 57600 - Health And Aging In Social Context Credits: 3.00
- SOC 59100 - Selected Topics In Sociology Credits: 1.00 to 3.00 Sociology ProSeminar, Social Psychology of Mental Disorders
Spanish (SPAN)

- SPAN 23100 - Cervantes' Don Quixote **Credits**: 3.00
- SPAN 23500 - Spanish American Literature In Translation **Credits**: 3.00 Food/Culture in Hispanic World, Latin American Short Stories, Spanish American Literature in Translation (select courses satisfy Human Cultures Humanities for core)
- SPAN 24100 - Introduction To The Study Of Hispanic Literature **Credits**: 3.00
- SPAN 28000 - Second-Year Spanish: Special Topics **Credits**: 3.00 Intro Latin Am & Latino Study
- SPAN 33000 - Spanish And Latin American Cinema **Credits**: 3.00
- SPAN 33500 - The Literature Of The Spanish-Speaking Peoples In The United States **Credits**: 3.00
- SPAN 34100 - Hispanic Literature I: Poetry And Drama **Credits**: 3.00
- SPAN 34200 - Hispanic Literature II: Prose **Credits**: 3.00
- SPAN 39800 - Special Topics In Spanish **Credits**: 1.00 to 3.00 The Hispanic World
- SPAN 48000 - Spanish Civilization **Credits**: 3.00
- SPAN 48100 - Spanish Culture **Credits**: 3.00
- SPAN 48200 - Latin American Civilization **Credits**: 3.00
- SPAN 48300 - Latin American Culture **Credits**: 3.00
- SPAN 48500 - Food And Culture In The Hispanic World **Credits**: 3.00
- SPAN 49800 - Advanced Topics In Spanish **Credits**: 1.00 to 3.00 Chicana/o & Latina/o Lit Trans, Food Culture Hispanic World, Hispanic Film in Spanish
- SPAN 54000 - Spanish Literature Of The Middle Ages **Credits**: 3.00
- SPAN 54100 - Spanish Literature Of The Golden Age **Credits**: 3.00
- SPAN 54200 - Cervantes Don Quijote **Credits**: 3.00
- SPAN 54300 - Spanish Literature Of The 18th And 19th Centuries **Credits**: 3.00
- SPAN 54500 - Spanish Literature Of The 20th Century **Credits**: 3.00
- SPAN 55000 - Spanish American Literature Of The Colonial Period **Credits**: 3.00
- SPAN 55100 - Spanish American Literature Of The 19th Century **Credits**: 3.00
- SPAN 55200 - Spanish American Literature From 1900 To 1970 **Credits**: 3.00
- SPAN 55300 - Spanish American Literature From 1970 - Present **Credits**: 3.00
- SPAN 55400 - Hispanic Caribbean Literature **Credits**: 3.00
- SPAN 55500 - Latino/a Literature **Credits**: 3.00
- SPAN 55600 - Mexican Literature **Credits**: 3.00
- SPAN 59400 - Special Topics In Hispanic Literature **Credits**: 1.00 to 4.00 Spanish Literature of the Middle Ages, The Continental Novel, Transatlantic Poetry, Hispanic Film in Span Part II, Modern Spanish Comic Theater, Borders and Borderlands
- SPAN 59000 - Directed Reading In Spanish **Credits**: 1.00 to 4.00 Spanish American Novel

Sustainable Food & Farm Systems (SFS)

- SFS 41100 - Structural Racism In US Agriculture **Credits**: 1.00
- SFS 41200 - Colonialism, Globalization, And Food Justice **Credits**: 1.00
- SFS 41300 - The Cultures And Agricultures Of The United States **Credits**: 1.00

Theatre (THTR)

- THTR 20100 - Theatre Appreciation **Credits**: 3.00
- THTR 38000 - Histories Of Theatre **Credits**: 3.00
• THTR 38100 - Theatre And Performance Historiography Credits: 3.00
• THTR 39000 - Directed Study Of Special Theatre Problems Credits: 1.00 to 3.00 Hamilton the Musical, Black Drama

Women, Gender, & Sexuality Studies (WGSS)

• WGSS 28000 - Women's, Gender, And Sexuality Studies: An Introduction Credits: 3.00
• WGSS 28100 - Variable Topics In Women's, Gender, And Sexuality Studies Credits: 1.00 to 4.00 Arab Women Writers, Contemporary Foreign Women Writers in Translation, Spanish American Literature in Translation, Women Writers in Translation, Women, Gender, and Leadership, 20th Century Women Artists, Intro to Study of Religion, Wom Pol and Publ Pol
• WGSS 28200 - Introduction To LGBTQ Studies Credits: 3.00
• WGSS 38000 - Comparative Studies In Gender And Culture Credits: 3.00
• WGSS 38100 - Women Of Color In The United States Credits: 3.00
• WGSS 38200 - Love, Sex And Sexuality Credits: 3.00
• WGSS 38300 - Women, Work, And Labor Credits: 3.00
• WGSS 39000 - Variable Topics In Women's, Gender And Sexuality Studies Credits: 1.00 to 4.00 American Beauty, Gender Revolution in Mod Amer, Gender and Politics in Early Modern Europe, Literature, Queer Studies & Disability, Queens and Empresses in Early Modern Europe, Women & Games: Design Dev & Play, Understanding the NFL, Women and Leadership, Hist of Sexual Regul in US, Gender and Literature, Feminist Technoscience Studies, Latina Feminisms, Sports & Popular Feminisms, US Women Since 1870, Women and the Law, STEM and Gender, Women and Health in America
• WGSS 48000 - Feminist Theory Credits: 3.00
• WGSS 48200 - Interdisciplinary Studies In Sexuality Credits: 3.00
• WGSS 48300 - Feminisms In Global Perspective Credits: 3.00
• WGSS 48500 - Feminist Perspectives On Film Credits: 3.00
• WGSS 49900 - Independent Study In Women's, Gender And Sexuality Studies Credits: 1.00 to 4.00 Black Women Writers, African American Women and Activism, Black Women, Gender Revolution in Modern America, Women and Health in America
• WGSS 59900 - Selected Topics In Women's Gender And Sexuality Studies Credits: 3.00 Bad Mothers in American Literature, Gender & Sexuality in Sport, Native American Women Writers, Public Pol and Family

College of Science Core: Great Issues in Science

Curricular Outcomes: ability to think and function as a scientist and demonstrated breadth of knowledge

This important core requirement challenges College of Science students to apply their critical thinking and analytical abilities gained from engagement in their major area of study to the global conversation regarding the impact of Science on society and the ramifications of scientific advances.

Curriculum Notes

• Courses which have been taken to meet the Great Issues requirement may not also be used to meet a student's Culture/Diversity or General Education requirement.
• AP, IB, and A LEVEL credit will not be approved to meet the Great Issues requirement.
• Transfer courses from accredited institutions may be submitted to as student's advisor for review by the Associate Dean of Undergraduate Education.
Some courses on the Great Issues in Science approved course list share the same course subject and number, however, they have different variable titles. Only those titles listed are approved. Consult with your advisor if you have a question about the suitability of a course.

Great Issues in Science

Choose one course from the list below; all courses must be taken as 3.00 credit hours.

- BIOL 31200 - Great Issues Genomics And Society Credits: 3.00
- BIOL 31800 - The COVID-19 Pandemic Credits: 3.00
- BIOL 39500 - Special Assignments Credits: 0.00 to 18.00 Genes and Society (3.00 credits)
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 49500 - Special Assignments Credits: 0.00 to 18.00
  Data Science: Good Versus Bad, Energy Transduction
- CHM 49000 - Selected Topics In Chemistry For Upper-Division Students Credits: 1.00 to 4.00 The Nuclear Age
- CNIT 49900 - Topics In Computer And Information Technology Credits: 1.00 to 3.00 Seminar Global Policy Issues
- CS 36100 - Great Issues In Computer Science Credits: 3.00
- EAPS 30100 - Oil! Credits: 3.00
- EAPS 32700 - Climate, Science And Society Credits: 3.00
- EAPS 36000 - Great Issues In Climate Change And Society Credits: 3.00
- EAPS 36400 - Natural Hazards: Science And Society Credits: 3.00
- EAPS 37500 - Great Issues - Fossil Fuels, Energy And Society Credits: 3.00
- EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00 Models in Climate Change Science & Policy
- HIST 31305 - Medical Devices And Innovation Credits: 3.00
- HIST 35205 - Death, Disease And Medicine In Twentieth Century American History Credits: 3.00
- HONR 29900 - Interdisciplinary Honors - Experiential Learning Credits: 1.00 to 6.00 Food Security
- HONR 31000 - Space-Time! Credits: 3.00
- HONR 39900 - Interdisciplinary Honors - Special Topics Seminar Credits: 1.00 to 6.00 Human Redesign, Biotechnology: Social & Ethical Issues, Holocene, Rise & Fall of American Empire, The Nuclear Age: Its Science, History, and Ethics, Spacetime!
- MA 27900 - Modern Mathematics In Science And Society Credits: 3.00
- MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 History of Math
- ME 49200 - Technology And Values Credits: 3.00
- PHYS 31700 - Special Nuclear Materials Credits: 3.00
- PHYS 49000 - Special Assignments Credits: 1.00 to 3.00 Sustainable Energy Sources, Data Science: Good Versus Bad
- POL 32700 - Global Green Politics Credits: 3.00
- POL 42900 - Contemporary Political Problems Credits: 3.00 Climate, Science and Society
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 Data Science: Good Versus Bad

College of Science Core: Laboratory Science

Curricular Outcome: Ability to think and function as a scientist
College of Science students will complement critical thinking and analytical abilities gained within their major area of study by completing an approved two-course sequence and related laboratory experience in a science outside of their major.

**Laboratory Science**

College of Science students must take a minimum of a one-year sequence of laboratory science.

**Biology Sequences**

Sequence 1 (for life scientists who are not Biology majors)

- BIOL 11000 - Fundamentals Of Biology I Credits: 4.00
- BIOL 11100 - Fundamentals Of Biology II Credits: 4.00

Sequence 2

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00

**Chemistry Sequences**

Sequence 1

- CHM 11500 - General Chemistry Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Sequence 2

- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

**Earth, Atmospheric, and Planetary Sciences Sequence**

Sequence 1

- EAPS 11100 - Physical Geology Credits: 3.00
- EAPS 11200 - Earth Through Time Credits: 3.00

**Physics Sequences (8.0 credits required for a sequence)**

PHYSICS I - Physics I AND Physics II are required for a sequence.

Physics I courses
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00

PHYSICS II - Physics I AND Physics II are required for a sequence.

Physics II courses
- PHYS 22100 - General Physics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
  AND
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

College of Science Core: Mathematics

Curricular Outcome: Ability to think and function as a scientist
College of Science students will complement critical thinking and analytical abilities gained within their major area of study by completing an approved one-year sequence of single variable calculus.

Mathematics

College of Science students must take a minimum of a one-year sequence of single variable calculus.

The following sequences are acceptable:

Sequence I
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00
  OR
Sequence II
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Or an approved two-course mathematics sequence for a particular major

College of Science Core: Science Technology and Society Requirement

Curricular Outcome: Ability to function in a multidisciplinary setting.

Requirement

The Science Technology and Society requirement is met by completing a Science, Technology and Society course.

Note: Students completing the Statewide General Transfer Course will not meet the Science Technology and Society UCORE outcome and therefore, must complete an STS course.
College of Science Core: Statistics

Curricular Outcome: Ability to think and function as a scientist

College of Science students will complement critical thinking and analytical abilities gained within their major area of study by completing an approved Statistics course.

Statistics

The Statistics requirement is met by completion of an approved statistics course in a student's program of study (major). Check specific department and major requirements for approval of the following courses:

- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 35500 - Statistics For Data Science Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00

College of Science Core: Teambuilding and Collaboration

Curricular Outcome: ability to collaborate as part of a team. Students will learn the concepts involved in Teaming and Collaboration, such as leadership, developing shared goals, and utilizing strengths of team members. These foundations will allow them to then enter collaborative situations fully prepared to maximize the value of their educational experiences as well as develop positive working relationships with their fellow students.

The Teaming and Collaboration core requirement is met through completion of coursework or an approved experiential learning contract.

Teambuilding & Collaboration

Note: Transfer Credit (including AP, IB, and A LEVEL credit) will not meet the Teaming Experience Requirement.

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- CS 30700 - Software Engineering I Credits: 3.00
- CS 40800 - Software Testing Credits: 3.00
- EAPS 32700 - Climate, Science And Society Credits: 3.00
- EAPS 36000 - Great Issues In Climate Change And Society Credits: 3.00
- EAPS 36400 - Natural Hazards: Science And Society Credits: 3.00
- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00
- ENGR 13100 - Transforming Ideas To Innovation I Credits: 2.00
- ENGR 13300 - Transforming Ideas To Innovation, EPICS/VIP Credits: 2.00
- ENGR 14100 - Honors Creativity And Innovation In Engineering Design I Credits: 3.50
- ENGR 16100 - Honors Introduction To Innovation And The Physical Science Of Engineering Design I Credits: 4.00
- ENTR Courses (Exceptions: ENTR 46000 is not approved for Teamwork and Collaboration; Variable Title courses must be approved by the Director of Undergraduate Education)
- ENTR Capstone Course
- EPCS 10000-40000 Engineering Projects in Community Service
- EPCS 49000 - EPICS Special Topics Course Credits: 1.00 to 3.00 Camp Riley
- PHYS 17200 - Modern Mechanics Credits: 4.00
- ROTC
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00
- TECH 39900 - Special Topics in Technology III Credits: 1.00 to 3.00 The Science and Practice of Complex Collaboration
- Approved Co-op, Internships, Undergraduate Research

- Three (3) of the following one (1) credit courses:
  - MA 29000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00 The Data Science Labs in Multivariate Calculus
  - MA 39000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00 The Data Science Labs in Fourier Analysis
  - MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 The Data Science Labs in on Probability

- TDM Course Sequence - students can use a 4.0 credit hour combination of TWO Data Mine Seminar courses and TWO Corporate Partner courses to meet the Teambuilding and Collaboration requirement.
  - TDM Seminar courses (TWO courses are required)
    - TDM 10100 - The Data Mine Seminar I Credits: 1.00
    - TDM 10200 - The Data Mine Seminar II Credits: 1.00
    - TDM 20100 - The Data Mine Seminar III Credits: 1.00
    - TDM 20200 - The Data Mine Seminar IV Credits: 1.00
    - TDM 30100 - The Data Mine Seminar V Credits: 1.00
    - TDM 30200 - The Data Mine Seminar VI Credits: 1.00
    - TDM 40100 - The Data Mine Seminar VII Credits: 1.00
    - TDM 40200 - The Data Mine Seminar VIII Credits: 1.00

AND
  - TDM Corporate Partners courses (TWO courses are required)
    - TDM 11100 - Corporate Partners I Credits: 3.00
    - TDM 11200 - Corporate Partners II Credits: 3.00
    - TDM 21100 - Corporate Partners III Credits: 3.00
    - TDM 21200 - Corporate Partners IV Credits: 3.00
    - TDM 31100 - Corporate Partners V Credits: 3.00
    - TDM 31200 - Corporate Partners VI Credits: 3.00
    - TDM 41100 - Corporate Partners VII Credits: 3.00
    - TDM 41200 - Corporate Partners VIII Credits: 3.00

- 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 in an inclusive environment. 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 all 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 welcome and 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!

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.

Bachelor of Science

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

Biological Sciences Major Change (CODO) Requirements
Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the preceding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.
Departmental/Program Major Courses (33-35 credits)

Biology 2.0 Major GPA: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

BIOL 500-level course: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.

Biology Core (19 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (14-16 credits)

Must have at least 14 credits of coursework, including courses which meet each of the following categories: "Intermediate," "Group A," "Group B," "BIOL 500-level," and "Base Lab Requirement."

Courses may double-dip among requirements; if used multiple places, course credits will only count once towards the required 14 credits of Upper-Level Biology Coursework. Any excess Upper-Level Biology Coursework beyond 16 credits will count as "free electives."

Intermediate Selective (0-4 credits)

Choose one of the options below. All options are also listed under either Group A or Group B selective. A course may double-dip among requirements; if used multiple places, course credits will only count once towards the required 14 credits of Upper-Level Biology Coursework.

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
Group A Selective (at least 2 credits)

Course may overlap with other major requirements.

- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 44400 - Human Medical Genetics Credits: 3.00
- BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
- BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
- BIOL 48100 - Eukaryotic Genetics Credits: 3.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
- BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
- BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
- BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
- BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
- BIOL 52900 - Bacterial Physiology Credits: 3.00
- BIOL 53300 - Medical Microbiology Credits: 3.00
- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
- BIOL 54100 - Molecular Genetics Of Bacteria Credits: 3.00
- BIOL 54900 - Microbial Ecology Credits: 2.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
- BIOL 56200 - Neural Systems Credits: 3.00
- BIOL 56310 - Protein Bioinformatics Credits: 3.00
- BCHM 43400 - Medical Topics In Biochemistry Credits: 3.00
- BCHM 56200 - General Biochemistry II Credits: 3.00

Group B Selective (at least 2 credits)

Course may overlap with other major requirements.

- BIOL 20400 - Human Anatomy And Physiology Credits: 4.00
- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 53700 - Immunobiology Credits: 3.00
- BIOL 58000 - Evolution Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58601 - Ecology Credits: 3.00
- BIOL 58705 - Animal Communication Credits: 3.00
- BIOL 59100 - Field Ecology Credits: 3.00 or 4.00
• BIOL 59200 - The Evolution Of Behavior Credits: 3.00
• HORT 30100 - Plant Physiology Credits: 4.00

BIOL 500-level Selective (0 or 2-3 credits)

Select one 2-3 credit BIOL 500-level course from Group A or Group B. Note: BCHM 52100 (in "Additional Selective Courses" below) is currently the only non-"BIOL" subject area course approved for this requirement.

A course may double-dip among requirements; if used multiple places, course credits will only count once towards the required 14 credits of Upper-Level Biology Coursework.

Base Lab Requirement (0-4 credits)

Click Base Lab Requirements for all Biology majors for additional lists. Courses used for the Base Lab Requirement may also count for other major requirements.

Additional Selective Courses (1-9 credits)

Additional courses if needed to reach 14 credits total Upper Level Biology Coursework.

Can either be additional courses from Groups A or B or the 'Base Lab Requirement' above, or from the lists below.

Undergraduate Research (0-3 credits)

A maximum of 3 credits total (combined BIOL 49400/49900) can count towards the "Upper-Level Biology Coursework" tally (any credits beyond three count as free "electives").

NOTE: if using Undergraduate Research towards the "Base Lab Requirement": Objectives A and/or B, FOUR credits must be accumulated, plus the Research Mentor's approval as one or both Objectives. However, only THREE credits (the equivalent of a single typical course) contribute to the "Upper-Level Biology Coursework" minimum of 14 credits.

• BIOL 49400 - Biology Research Credits: 1.00 to 4.00
• BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00

Academic Seminars/Other Courses

• BIOL 44100 - Biology Senior Seminar In Genetics Credits: 1.00
• BCHM 52100 - Comparative Genomics Credits: 3.00

Other Departmental Requirements: (51-73 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

• CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

Organic Chemistry (8 credits)
• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00

College Of Science Core Requirements

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation (3-10 credits)

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ or
• TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II.

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from the list HERE.

**Laboratory Science (8 credits)**

Choose one Physics I and one Physics II option.

**Physics I**

- PHYS 23300 - Physics For Life Sciences I Credits: 4.00 or
- PHYS 17200 - Modern Mechanics Credits: 4.00

**Physics II**

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

**Mathematics (6-10 credits)**

Choose one Calculus I course and one Calculus II course. (fulfills QR for core)

**Calculus I**

- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

**Calculus II**

- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

*Met with required major coursework (BIOL 12100).

Statistics (3 credits)

- STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.

Electives (12-36 credits)

GPA Requirements

- Biology 2.0 Major GPA: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are ”free electives” and not included in this calculation.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- BIOL 500-level course: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
• CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
• BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
• BIOL 1450x (see above for currently available titles) Credit Hours: 2.00
• MA 16010 - Applied Calculus I Credits: 3.00 or
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits

Spring 1st Year

• BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 and
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• MA 16020 - Applied Calculus II Credits: 3.00 or
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Written Communication Selection - Credit Hours: 3.00-4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits

Fall 2nd Year

• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
• COM 21700 - Science Writing And Presentation Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits
Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-1.00

14-15 Credits

Fall 3rd Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Intermediate Biology Selective - Credit Hours: 2.00 - 3.00
- Group A Selective - Credit Hours: 2.00 - 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-3.00

13-14 Credits

Spring 3rd Year

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Group B Selective - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-1.00

14 Credits

Fall 4th Year

- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- Base Lab Requirement - Credit Hours: 2.00 - 4.00
- Great Issues in Science - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 0.00-2.00

12-16 Credits

Spring 4th Year

- Science Core Computing Selection - Credit Hours: 2.00-4.00 ♦
- Biology Selective 50000 Level - Credit Hours: 3.00
- Biology Selective - Credit Hours: 0.00-1.00
- Elective - Credit Hours: 2.00-4.00
- Elective - Credit Hours: 3.00-4.00

12-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
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

Biological Sciences Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (32-38 credits)

**Biology 2.0 Major GPA:** A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

**BIOL 500-level course:** Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

**Upper-Level Biology Coursework (13-19 credits)**
Intermediate Biology Selective (3 credits)

Choose one option below; cannot overlap with CMDB Selectives or Biology Selectives.

- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00

CMDB Selective I (5-6 credits)

Choose TWO courses from the following list. Neither course may overlap with Intermediate Biology or Biology Selective requirements.

- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 48100 - Eukaryotic Genetics Credits: 3.00

CMDB Selective II: BIOL 500-level (3 credits)

This course may not overlap with the Biology Selective requirements. Options listed here also meet the departmental "500-level BIOL course."

- BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
- BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00

Biology Selective (for CMDB) (2-3 credits)

This course may not overlap with the Intermediate or CMDB Selectives I or II.

- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 44400 - Human Medical Genetics Credits: 3.00
- BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
- BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
- BIOL 48100 - Eukaryotic Genetics Credits: 3.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
- BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
- BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
- BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
- BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 53300 - Medical Microbiology Credits: 3.00
- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
- BIOL 53700 - Immunobiology Credits: 3.00
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
- BIOL 56200 - Neural Systems Credits: 3.00
- BIOL 56310 - Protein Bioinformatics Credits: 3.00
- BIOL 58000 - Evolution Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58601 - Ecology Credits: 3.00
- BIOL 58705 - Animal Communication Credits: 3.00
- BIOL 59200 - The Evolution Of Behavior Credits: 3.00
- BCHM 43400 - Medical Topics In Biochemistry Credits: 3.00
- BCHM 52100 - Comparative Genomics Credits: 3.00

Base Lab Requirement (0-4 credits)

Click Base Lab Requirements for all Biology majors for additional lists. Courses used for the Base Lab Requirement may also count for other major requirements.

Other Departmental Requirements: (51-73 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

Organic Chemistry (8 credits)

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00

College of Science Core Requirements (34-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation
Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found HERE. (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ or
- TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from the list HERE.
Laboratory Science (8 credits)

Choose one Physics I and one Physics II option.

Physics I

- PHYS 23300 - Physics For Life Sciences I Credits: 4.00 or
- PHYS 17200 - Modern Mechanics Credits: 4.00

Physics II

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)

Choose one Calculus I course and one Calculus II course. (satisfies QR for core)

Calculus I

- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II

- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

Met with required major coursework (BIOL 12100).

Statistics (3 credits)

- STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.
Electives (9-39 credits)

GPA Requirements

- **Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00
- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits
Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 and
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits

Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-2.00

14-16 Credits

Fall 3rd Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Intermediate Biology Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 2.00-3.00
• Elective - Credit Hours: 0.00-3.00

12-16 Credits

Spring 3rd Year

• PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
• CMDB Selective I (1 of 2) - Credit Hours: 2.00 - 3.00
• Biology Selective - Credit Hours: 2.00 - 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 1.00-4.00

14-15 Credits

Fall 4th Year

• STAT 50300 - Statistical Methods For Biology Credits: 3.00
• CMDB Selective I (2 of 2) - Credit Hours: 3.00
• Base Lab Requirement - Credit Hours: 0.00-4.00
• Great Issues In Science - Credit Hours: 3.00
• Elective - Credit Hours: 0.00-4.00

13 Credits

Spring 4th Year

CMDB Selective II

• BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
• BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
• BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
• Science Core: Computing - Credit Hours: 2.00 - 4.00
• Team-Building & Collaboration - Credit Hours: 0.00 - 3.00
• Elective - Credit Hours: 2.00-4.00
• Elective - Credit Hours: 0.00-4.00

12-13 Credits
Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Chemical Biology & Biochemistry, 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 Website

Chemical Biology & Biochemistry Major Change (CODO) Requirements

Degree Requirements
120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (64-65 credits)
**Biology/Chemistry 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900 and CHM 49900) may be factored into the Major GPA calculation. Any excess Biology and Chemistry courses/research credits are "free electives" and not included in this calculation.

**BIOL 500-level course**: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

**Chemistry Core (13 credits)**

**General Chemistry (5 credits)**

- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

**Organic Chemistry (8 credits)**

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

**Upper-Level Biology and Chemistry Coursework (32-33 credits)**

**Intermediate Biology Selective (3 credits)**

- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
Required coursework (18 credits)

- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- CHM 32700 - Bioanalytical Chemistry Credits: 4.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- CHM 34800 - Bioinorganic Chemistry Credits: 3.00
- CHM 37200 - Physical Chemistry Credits: 4.00

CBB Selective I (3 credits)

- BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
- CHM 56000 - Organic Spectroscopic Analysis Credits: 3.00

CBB Selective II: BIOL 500-level (3 credits)

These courses also meet the departmental "BIOL 500-level" requirement.

- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
- BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00

CBB-Related Research (2-3 credits, across 2+ semesters)

At least TWO semesters of research performed after successful completion of BIOL 23100 and BIOL 24100. This research is in addition to the CBB Capstone, and must be with approved faculty.

- BIOL 49400 - Biology Research Credits: 1.00 to 4.00
- BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00

CBB Research Capstone (3 credits)

Fulfills Base Lab Requirement.

- CHM 49000 - Selected Topics In Chemistry For Upper-Division Students Credits: 1.00 to 4.00 - Capstone in Chemical Biology Credit Hours: 3.00

Other Departmental Requirements (36-56 credits)

College of Science Core Requirements (36-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.
Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.**
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

- CS 15900 - C Programming Credits: 3.00 ♦
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)
Choose one from the list HERE.

**Laboratory Science (8 credits)**

Choose one Physics I and one Physics II option.

**Physics I**

- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00

**Physics II**

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

**Mathematics (8-10 credits)**

Choose one Calculus I course and one Calculus II course. (satisfies QR for core)

**Calculus I**

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

**Calculus II**

- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

**Science Technology and Society**

*Met with required major coursework (BIOL 12100).*

**Statistics (3 credits)**

- STAT 50300 - Statistical Methods For Biology Credits: 3.00

**Team-Building and Collaboration* (0 or 3 credits)**

This requirement can double-dip with other degree requirements if taken at Purdue University, such as CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.
Electives (0-20 credits)

GPA Requirements

- 2.0 Graduation GPA required for Bachelor of Science degree.
- **Biology/Chemistry 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900 and CHM 49900) may be factored into the Major GPA calculation. Any excess Biology and Chemistry courses/research credits are "free electives" and not included in this calculation.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

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College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Written Composition Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

15-17 Credits

Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
• BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
• BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00
  CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
  CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
  MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00

16-17 Credits

Fall 2nd Year

• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Spring 2nd Year

• BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00
• Science Core Selection - Credit Hours: 3.00-4.00

14-15 Credits

Fall 3rd Year

• BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
• CHM 32700 - Bioanalytical Chemistry Credits: 4.00
• Physics I Selective - Credit Hours: 4.00
• CBB-Related Research - Credit Hours: 1.00-2.00
• Science Core Selection - Credit Hours: 3.00-4.00

15-17 Credits

Spring 3rd Year

• BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- Physics II Selective - Credit Hours: 4.00
- CBB-Related Research - Credit Hours: 1.00
- Science Core Selection - Credit Hours: 3.00

14 Credits

**Fall 4th Year**

- CHM 34800 - Bioinorganic Chemistry Credits: 3.00
- CBB Selective I
  - BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00 or
- CHM 56000 - Organic Spectroscopic Analysis Credits: 3.00
- CBB Selective II or Science Core: Computing - Credit hours: 3.00 - 4.00
- Science Core Selection - Credit hours: 0.00-3.00
- Elective - Credit hours: 1.00-3.00

12-13 Credits

**Spring 4th Year**

- CHM 37200 - Physical Chemistry Credits: 4.00
- CHM 49000 - Selected Topics In Chemistry For Upper-Division Students Credits: 1.00 to 4.00 - Capstone in Chemical Biology Credit Hours: 3.00
- Great Issues in Science - Credit hours: 3.00
- Science Core: Computing - Credit hours: 2.00 - 4.00
- Elective - Credit hours: 1.00-3.00

15 Credits

**Pre-Requisite Information**

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

**World Language Courses**

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

**Critical Course**

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to
persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Ecology, Evolution, and Environmental Biology, BS

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (33-37 credits)

**Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

**BIOL 500-level course**: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior **Credits: 2.00** (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms **Credits: 3.00**
- BIOL 13500 - First Year Biology Laboratory **Credits: 2.00** or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors **Credits: 2.00** or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors **Credits: 2.00** or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors **Credits: 2.00**
- BIOL 23100 - Biology III: Cell Structure And Function **Credits: 3.00**
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function **Credits: 2.00**
- BIOL 24100 - Biology IV: Genetics And Molecular Biology **Credits: 3.00**
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology **Credits: 2.00**
- BIOL 28600 - Introduction To Ecology And Evolution **Credits: 2.00**

**Upper-Level Biology Coursework (14-18 credits)**

**Intermediate Biology Selective (2-4 credits)**
Choose one of the options below.

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00

Required Coursework (6 credits)

These courses also meet the departmental "BIOL 500-level" requirement.

- BIOL 58000 - Evolution Credits: 3.00
- BIOL 58601 - Ecology Credits: 3.00

Ecology Selective I (3 credits)

Select one; May not overlap with Ecology Selective II.

- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58705 - Animal Communication Credits: 3.00
- BIOL 59100 - Field Ecology Credits: 3.00 or 4.00
- BIOL 59200 - The Evolution Of Behavior Credits: 3.00

Ecology Selective II (2-4 credits)

Select 1 course. May not overlap with Ecology Selective I.

- AGEC 52500 - Environmental Policy Analysis Credits: 3.00
- ANTH 53500 - Foundations Of Biological Anthropology Credits: 3.00
- ANTH 53600 - Primate Ecology Credits: 3.00
- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58705 - Animal Communication Credits: 3.00
- BIOL 59100 - Field Ecology Credits: 3.00 or 4.00
- BIOL 59200 - The Evolution Of Behavior Credits: 3.00
- BTNY 30200 - Plant Ecology Credits: 3.00
- BTNY 30500 - Plant Evolution And Taxonomy Credits: 3.00
- BTNY 56100 - Survey Of Mathematical Biology Credits: 3.00
- CE 35000 - Introduction To Environmental And Ecological Engineering Credits: 3.00
• EEE 35000 - Introduction To Environmental And Ecological Engineering Credits: 3.00
• FNR 44700 - Vertebrate Population Dynamics Credits: 4.00
• POL 52300 - Environmental Politics And Public Policy Credits: 3.00

Base Lab Requirement (1 credit)

• BIOL 58602 - Laboratory In Ecology Credits: 1.00

Other Departmental /Program Course Requirements (51-76 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

• CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

Organic Chemistry (8 credits)

• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00

College of Science Core Requirements (34-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation (3-10 credits)

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
• **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing (2-4 credits)**

- CS 15900 - C Programming **Credits**: 3.00 ♦ or
- CS 17600 - Data Engineering In Python **Credits**: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects **Credits**: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits**: 4.00 ♦ or
- TDM 10100 - The Data Mine Seminar I **Credits**: 1.00 and TDM 10200 - The Data Mine Seminar II.

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from the list HERE.

**Laboratory Science (8 credits)**

Choose one Physics I and one Physics II option.

**Physics I**

- PHYS 23300 - Physics For Life Sciences I **Credits**: 4.00 or
- PHYS 17200 - Modern Mechanics **Credits**: 4.00

**Physics II**
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)

Choose one Calculus I course and one Calculus II course. (fulfills QR for core)

Calculus I

• MA 16010 - Applied Calculus I Credits: 3.00 or
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II

• MA 16020 - Applied Calculus II Credits: 3.00 or
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

*Met with required major coursework (BIOL 12100).

Statistics (3 credits)

• STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.

Electives (7-36 credits)

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree.
• Biology 2.0 Major GPA: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.
• Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HORT 49100, HDFS 39000, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement
The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00 MA 16010 - Applied Calculus I Credits: 3.00 or
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 5.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits

Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦ and
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits
Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Elective - Credit Hours: 1.00 (BIOL 29300 strongly recommended)
- Elective - Credit Hours: 0.00-3.00

12-15 Credits

Fall 3rd Year

- BIOL 58601 - Ecology Credits: 3.00
- Base Lab Requirement  BIOL 58602 - Laboratory In Ecology Credits: 1.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-3.00

14-17 Credits

Spring 3rd Year

- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Ecology Selective I - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

12-14 Credits

Fall 4th Year

- Intermediate Biology Selective - Credit Hours: 2.00 - 4.00
- Biology Selective - Credit Hours: 2.00 - 4.00
- Science Core: Great Issues Selective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-4.00
- Elective - Credit Hours: 0.00-4.00

12-15 Credits

Spring 4th Year

- BIOL 58000 - Evolution Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 0.00-3.00
- Elective - Credit Hours: 2.00-4.00
- Elective - Credit Hours: 2.00-4.00
- Elective - Credit Hours: 3.00

13-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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

Biological Sciences Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.
Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Degree Requirements**

**120 Credits Required**

**Departmental/Program Major Courses (30-37 credits)**

**Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

**BIOL 500-level course**: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
• BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
• BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (11-18 credits)

Intermediate Biology Selective (2-4 credits)

Choose one of the following options.

• BIOL 32800 - Principles Of Physiology Credits: 4.00
• BIOL 36700 - Principles Of Development Credits: 2.00
• BIOL 38700 - Macromolecules Credits: 2.00
• BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
• BIOL 41600 - Viruses And Viral Disease Credits: 3.00
• BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
• BIOL 43600 - Neurobiology Credits: 3.00

Required Coursework (4 credits)

• BIOL 44100 - Biology Senior Seminar In Genetics Credits: 1.00
• BIOL 48100 - Eukaryotic Genetics Credits: 3.00

Genetics Selectives (6 credits)

Select 2 courses; at least one of the two courses must be a course approved to meet the "BIOL 500-level" requirement.

Genetics Selective I: BIOL 500-level (3 credits)

Courses approved to meet the departmental "500-level Biology course". Select one.

• BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
• BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
• BIOL 54100 - Molecular Genetics Of Bacteria Credits: 3.00
• BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
• BIOL 58000 - Evolution Credits: 3.00
• BCHM 52100 - Comparative Genomics Credits: 3.00

Genetics Selective II (3 credits)

Select a 2nd course, either an additional course from "Genetics Selective I: BIOL 500-level" above or one of the following options.

• BIOL 43800 - General Microbiology Credits: 3.00
• BIOL 44400 - Human Medical Genetics Credits: 3.00
• BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
• AGRY 53000 - Advanced Plant Genetics Credits: 3.00

Base Lab Requirement (0-4 credits)

Click Base Lab Requirements for all Biology majors for additional lists. Courses used for the Base Lab Requirement may also count for other major requirements.

Other Departmental Requirements: (51-76 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

• CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

Organic Chemistry (8 credits)

• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00

College of Science Core Requirements (34-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation (3-10 credits)

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
• **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.*

• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

- CS 15900 - C Programming **Credits:** 3.00 ♦ or
- CS 17600 - Data Engineering In Python **Credits:** 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects **Credits:** 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00 ♦ or
- TDM 10100 - The Data Mine Seminar I **Credits:** 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from the list HERE.

Laboratory Science (8 credits)

Choose one Physics I and one Physics II option.

Physics I

- PHYS 23300 - Physics For Life Sciences I **Credits:** 4.00 or
- PHYS 17200 - Modern Mechanics **Credits:** 4.00
Physics II

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)

Choose one Calculus I course and one Calculus II course. (satisfies QR for core)

Calculus I

- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II

- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

*Met with required major coursework (BIOL 12100).

Statistics (3 credits)

- STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.

Electives (7-39 credits)

GPA Requirements

- **Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.
- 2.0 Graduation GPA required for Bachelor of Science degree.
Course Requirements & Notes

- Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00 MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits

Spring 1st Year

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 and
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
16-20 Credits

Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-2.00

14-16 Credits

Fall 3rd Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Genetics Selective II - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 1.00-3.00

12-16 Credits

Spring 3rd Year

- BIOL 48100 - Eukaryotic Genetics Credits: 3.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
• Computing Selective - Credit Hours: 2.00 - 4.00 ♦
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 0.00-2.00

14 Credits

Fall 4th Year

• BIOL 44100 - Biology Senior Seminar In Genetics Credits: 1.00
• STAT 50300 - Statistical Methods For Biology Credits: 3.00
• Intermediate Biology Selective - Credit Hours: 2.00-4.00
• Great Issue Course Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 0.00-3.00
• Elective - Credit Hours: 0.00-4.00

12-13 Credits

Spring 4th Year

• Genetics Selective I: BIOL 500-level - Credit Hours: 3.00
• Base Lab Requirement - Credit Hours: 0.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00-4.00
• Elective - Credit Hours: 0.00-4.00

13-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be
proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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

Biological Sciences Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements
All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Degree Requirements

120 Credits Required

Departmental/Program Major Courses (40-41 credits)

**Biology 2.0 Major GPA:** A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

**BIOL 500-level course:** Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior **Credits:** 2.00 ♦ (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms **Credits:** 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory **Credits:** 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors **Credits:** 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors **Credits:** 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors **Credits:** 2.00
- BIOL 23100 - Biology III: Cell Structure And Function **Credits:** 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function **Credits:** 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology **Credits:** 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology **Credits:** 2.00
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (21-22 credits)

Intermediate Biology Selective (3 credits)

HLDS majors must use BIOL 43800 for this requirement.

• BIOL 43800 - General Microbiology Credits: 3.00

Human Anatomy & Physiology (8 credits)

• BIOL 20300 - Human Anatomy And Physiology Credits: 4.00
• BIOL 20400 - Human Anatomy And Physiology Credits: 4.00

Health & Disease Selective (3 credits)

Choose one; may not overlap with "Biology Selectives," but CAN double-dip with the "BIOL 500-level Selective" requirement.

• BIOL 41600 - Viruses And Viral Disease Credits: 3.00
• BIOL 53700 - Immunobiology Credits: 3.00

Biology Selectives (for HLDS) (5-6 credits)

Select two options. At least one Lecture Course Option MUST be selected. May not overlap with "Health & Disease Selective," but CAN double-dip with the "BIOL 500-level Selective" requirement.

'Undergraduate Research' or 'Laboratory Modules' may be taken in lieu of a second lecture course. If selected, 2-3 credits in that category must be chosen.

Lecture Course Options (2-6 credits)

If a BIOL 500-level Selective is NOT used for the "Health & Disease Selective" above, then at least one 2-3 credit BIOL 500-level Selective must be chosen here.

• BIOL 32800 - Principles Of Physiology Credits: 4.00
• BIOL 36700 - Principles Of Development Credits: 2.00
• BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
• BIOL 38700 - Macromolecules Credits: 2.00
• BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
• BIOL 41600 - Viruses And Viral Disease Credits: 3.00
• BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
• BIOL 43600 - Neurobiology Credits: 3.00
• BIOL 44400 - Human Medical Genetics Credits: 3.00
• BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
• BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
• BIOL 48100 - Eukaryotic Genetics Credits: 3.00
• BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
• BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
• BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
• BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
• BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
• BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
• BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
• BIOL 52900 - Bacterial Physiology Credits: 3.00
• BIOL 52905 - Disease Ecology Credits: 3.00
• BIOL 53300 - Medical Microbiology Credits: 3.00
• BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
• BIOL 53700 - Immunobiology Credits: 3.00
• BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
• BIOL 54100 - Molecular Genetics Of Bacteria Credits: 3.00
• BIOL 54900 - Microbial Ecology Credits: 2.00
• BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
• BIOL 56200 - Neural Systems Credits: 3.00
• BIOL 56310 - Protein Bioinformatics Credits: 3.00
• BIOL 58000 - Evolution Credits: 3.00
• BIOL 58210 - Ecological Statistics Credits: 3.00
• BIOL 58601 - Ecology Credits: 3.00
• BIOL 58705 - Animal Communication Credits: 3.00
• BIOL 59100 - Field Ecology Credits: 3.00 or 4.00
• BIOL 59200 - The Evolution Of Behavior Credits: 3.00
• BCHM 43400 - Medical Topics In Biochemistry Credits: 3.00
• BCHM 52100 - Comparative Genomics Credits: 3.00
• HORT 30100 - Plant Physiology Credits: 4.00

Undergraduate Research (2-3 credits if selected)

If Undergraduate Research is selected: must take at least 2 credits to satisfy one "course" for the Biology Selectives requirement.

A maximum of 3 credits total (combined BIOL 49400/49900) can count towards the "Biology Selectives" tally (any credits beyond three count as free "electives")

• BIOL 49400 - Biology Research Credits: 1.00 to 4.00
• BIOL 49900 - Biology Honors Thesis Research Credits: 1.00 to 4.00

Laboratory Modules (2-3 credits if selected)

If Laboratory Modules are selected: must take at least 2 credits to satisfy one "course" for the Biology Selectives requirement.

Additional options exist and vary by semester; please contact the Biology Advising Office for current selections.

• BIOL 44212 - Microscopy And Cell Biology Credits: 1.00

Base Lab Requirement (2 credits)

HLDS majors must use BIOL 43900 for this requirement.
Click Base Lab Requirements for all Biology majors for additional lists.

- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00

BIOL 500-level Selective (0 credits)

Select one 2-3 credit course approved to meet the departmental "BIOL 500-level selective." This course will double-dip with either the "Health & Disease Selective" or the "Biology Selectives (for HLDS)".

If a 2-3 credit "BIOL 500-level" course is NOT selected for the "Health & Disease Selective," then select a 2-3 credit BIOL 500-level course from the "Biology Selectives (for HLDS): Lecture Course Options" list above.

Other Departmental Requirements: (54-80 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Organic Chemistry (8 credits)

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00

Pre-Professional Selective (3 credits)

Choose one. May not overlap with General Education or Culture/Diversity requirements.

- ANTH 21200 - Culture, Food And Health Credits: 3.00
- ANTH 34000 - Global Perspectives On Health Credits: 3.00
- HIST 36305 - The History Of Medicine And Public Health Credits: 3.00
- HIST 47005 - Women And Health In America Credits: 3.00
- PHIL 27000 - Biomedical Ethics Credits: 3.00
- PHIL 28000 - Ethics And Animals Credits: 3.00
- PUBH 40000 - Human Diseases And Disorders Credits: 3.00
- PUBH 40500 - Principles Of Epidemiology Credits: 3.00
- SOC 27500 - Sociology Of Aging And The Life Course Credits: 3.00
- SOC 35200 - Drugs, Culture, And Society Credits: 3.00
- SOC 37400 - Medical Sociology Credits: 3.00
• SOC 46100 - Health And Social Behavior Credits: 3.00

College of Science Core Requirements (34-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation (3-10 credits)

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ or
• TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)
Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)
Choose one from the list HERE.

Laboratory Science (8 credits)
Choose one Physics I and one Physics II option.

Physics I
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00 or
- PHYS 17200 - Modern Mechanics Credits: 4.00

Physics II
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)
Choose one Calculus I course and one Calculus II course. (satisfies QR for core)

Calculus I
- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

Met with required major coursework (BIOL 12100).

Statistics (3 credits)
• STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.

Electives (0-26 credits)

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree.
• Biology 2.0 Major GPA: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

Course Requirements & Notes

• Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the [Civics Literacy Proficiency website](#).

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill *most, if not all*, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

**Sample 4-Year Plan**

**Fall 1st Year**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦
• BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
• BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00  MA 16010 - Applied Calculus I Credits: 3.00 or
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits

Spring 1st Year

• BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
• CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦ and
• CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• MA 16020 - Applied Calculus II Credits: 3.00 or
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits

Fall 2nd Year

• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
• COM 21700 - Science Writing And Presentation Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

• BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
• BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00
• Science Core Selection - Credit Hours: 3.00

14 Credits
Fall 3rd Year

- BIOL 20300 - Human Anatomy And Physiology Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Biology Selective - Credit Hours: 2.00-3.00
- Science Core Selection - Credit Hours: 3.00

13-14 Credits

Spring 3rd Year

- BIOL 20400 - Human Anatomy And Physiology Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Computing Selective - Credit Hours: 3.00-4.00 ♦
- Science Core Selection - Credit Hours: 3.00

14-15 Credits

Fall 4th Year

- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- Great Issues Course Option - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

14 Credits

Spring 4th Year

- BIOL 41600 - Viruses And Viral Disease Credits: 3.00 or
- BIOL 53700 - Immunobiology Credits: 3.00
- Biology Selective 500 Level - Credit Hours: 2.00
- Pre-Professional Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-4.00
- Elective - Credit Hours: 2.00

12-14 Credits
Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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

Biological Sciences Major Change (CODO) Requirements

Degree Requirements

120 Credits Required
Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (35-36 credits)

**Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are “free electives” and not included in this calculation.
BIOL 500-level course: Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements.

Biology Core (19 credits)

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 • (fulfills STS for UCC and Science cores)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (16-17 credits)

Intermediate Biology Selective (3 credits)

MICR majors must use BIOL 43800 for this requirement.

- BIOL 43800 - General Microbiology Credits: 3.00

Required Coursework: BIOL 500-Level (3 credits)

- BIOL 52900 - Bacterial Physiology Credits: 3.00

Microbiology Selectives (8-9 credits)

Complete THREE courses from the following:

- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
- BIOL 53300 - Medical Microbiology Credits: 3.00
- BIOL 53700 - Immunobiology Credits: 3.00
- BIOL 54100 - Molecular Genetics Of Bacteria Credits: 3.00
- BIOL 54900 - Microbial Ecology Credits: 2.00
- FS 37200 - Fermentation Microbiology Credits: 3.00
- FS 58100 - Microbial Genomics And Metabolism Credits: 3.00

Base Lab Requirement (2 credits)

MICR majors must use BIOL 43900 for this requirement.
Click Base Lab Requirements for all Biology majors for additional lists.

- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00

Other Departmental Requirements (51-76 credits)

Chemistry (17 credits)

General Chemistry (5 credits)

- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00

Organic Chemistry (8 credits)

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

Biochemistry (4 credits)

- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00

College of Science Core Requirements (34-56 credits)

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation (3-10 credits)

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.**
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ or
• TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

• General Education Option I
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from the list HERE.

Laboratory Science (8 credits)

Choose one Physics I and one Physics II option.

Physics I

• PHYS 23300 - Physics For Life Sciences I Credits: 4.00 or
• PHYS 17200 - Modern Mechanics Credits: 4.00

Physics II

• PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)

Choose one Calculus I course and one Calculus II course. (satisfies STS for core)

Calculus I

• MA 16010 - Applied Calculus I Credits: 3.00 or
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II

• MA 16020 - Applied Calculus II Credits: 3.00 or
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

Met with required major coursework (BIOL 12100).

Statistics (3 credits)

• STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 or 3 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements), or CS 17700 or 18000 (College of Science Core: Computing).

For the full list of options, click HERE.

Electives (8-34 credits)

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree.
• Biology 2.0 Major GPA: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

Course Requirements and Notes

• Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must
be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.
Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

**Fall 1st Year**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00 or
- MA 16010 - Applied Calculus I Credits: 3.00 or
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 0.00-1.00

16-18 Credits

**Spring 1st Year**

- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits

**Fall 2nd Year**
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-2.00

15-16 Credits

Fall 3rd Year

- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00 (Meets Base Laboratory Requirement)
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-3.00

15-16 Credits

Spring 3rd Year

- Microbiology Selective (#1 of 3): BIOL 41600 preferred
  Credit Hours: 3.00
  - BIOL 52900 - Bacterial Physiology Credits: 3.00
  - PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
  - PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
  - PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
  - Science Core Selection - Credit Hours: 3.00
  - Elective - Credit Hours: 2.00

13-14 Credits
Fall 4th Year

- Microbiology Selective (#2 of 3) - Credit Hours: 3.00
- Science Core: Computing Selective - Credit Hours: 2.00-4.00 ♦
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 1.00-3.00

12-14 Credits

Spring 4th Year

- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- Microbiology Selective (#3 of 3) - Credit Hours: 2.00 - 3.00
- Science Core Selection - Credit Hours: 0.00-3.00
- Elective - Credit Hours: 2.00-4.00
- Elective - Credit Hours: 1.00-4.00

12-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.
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**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**

**Biological Sciences Major Change (CODO) Requirements**

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.
College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (32-37 credits)

**Biology 2.0 Major GPA:** A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

**BIOL 500-level course:** Each student must take at least one 2-3 credit 500-level BIOL lecture course (excluding: lab-only courses such as BIOL 54200 or BIOL 59500 lab modules). This selection may double-dip with other major requirements. Note: BCHM 52100 is currently the only non-"BIOL" subject area course approved for this requirement.

**Biology Core (19 credits)**

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00 ♦ (fulfills STS for core)
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00 or
- BIOL 14503 - First Year Biology Lab: Disease Ecology-Honors Credits: 2.00 or
- BIOL 14504 - First Year Lab: Diet Disease And Immune System-Honors Credits: 2.00 or
- BIOL 14505 - First Year Biology Lab: Phages To Folds-Honors Credits: 2.00
- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Upper-Level Biology Coursework (13-18 Credits)
Intermediate Biology Selective (4 credits)

NRPH majors must use BIOL 32800 for this requirement.

- BIOL 32800 - Principles Of Physiology Credits: 4.00

Neurobiology & Physiology Selectives (6 credits)

Select two courses. May not overlap with "Biology Selective."

Since at least one course will be 500-level, this selection meets the departmental "BIOL 500-level" requirement.

- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
- BIOL 56200 - Neural Systems Credits: 3.00

Biology Selective (for NRPH) (2-4 credits)

May not overlap with "Neurobiology & Physiology Selectives."

- BIOL 20400 - Human Anatomy And Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- BIOL 41600 - Viruses And Viral Disease Credits: 3.00
- BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
- BIOL 43600 - Neurobiology Credits: 3.00
- BIOL 43800 - General Microbiology Credits: 3.00
- BIOL 44400 - Human Medical Genetics Credits: 3.00
- BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
- BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
- BIOL 48100 - Eukaryotic Genetics Credits: 3.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
- BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
- BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
- BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
- BIOL 52905 - Disease Ecology Credits: 3.00
- BIOL 53300 - Medical Microbiology Credits: 3.00
- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
- BIOL 53700 - Immunobiology Credits: 3.00
- BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
- BIOL 56200 - Neural Systems Credits: 3.00
- BIOL 56310 - Protein Bioinformatics Credits: 3.00
- BIOL 58000 - Evolution Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58601 - Ecology Credits: 3.00
- BIOL 58705 - Animal Communication Credits: 3.00
- BIOL 59200 - The Evolution Of Behavior Credits: 3.00
- BCHM 43400 - Medical Topics In Biochemistry Credits: 3.00
- BCHM 52100 - Comparative Genomics Credits: 3.00

**Base Lab Requirement (1-4 credits)**

NRPH majors meet the BLR "Required Course" with BIOL 32800 (see "Intermediate Biology Selective"). Select course(s) or research to satisfy Objectives A & B.

Select Base Lab Requirements for all Biology majors for additional lists.

**Other Departmental Requirements: (51-73 credits)**

**Chemistry (17 credits)**

**General Chemistry (5 credits)**

- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00 ♦

**Organic Chemistry (8 credits)**

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00

**Biochemistry (4 credits)**

- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00

**College of Science Core Requirements (34-56 credits)**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation (3-10 credits)**

**Written Communication (3-4 credits)**
Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

If CS 17700 or CS 18000 is selected and taken at Purdue University, these courses would also meet the College of Science: 'Team-Building & Collaboration' requirement.

- CS 15900 - C Programming Credits: 3.00 ♦
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- TDM 10100 - The Data Mine Seminar I Credits: 1.00 and TDM 10200 - The Data Mine Seminar II

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Humanities').

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from the list HERE to fulfill each Option below (select courses can also satisfy University Core: 'Behavioral/Social Sciences').

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from the list HERE.

Laboratory Science (8 credits)
Choose one Physics I and one Physics II course.

Physics I

- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00

Physics II

- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (6-10 credits)

Choose one Calculus I course and one Calculus II course. (fulfills QR for core)

Calculus I

- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00

Calculus II

- MA 16020 - Applied Calculus II Credits: 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society

Met with required major coursework (BIOL 12100).

Statistics (3 credits)

- STAT 50300 - Statistical Methods For Biology Credits: 3.00

Team-Building and Collaboration* (0 credits)

This requirement can double-dip with other degree requirements if taken at Purdue University, such as BIOL 32800 (Departmental/Program Major Requirements). NRPH majors are required to take BIOL 32800 as their "Intermediate Biology Selective."

For the full list of options, click HERE.

Electives (10-37 credits)
GPA Requirements

- 2.0 Graduation GPA required for Bachelor of Science degree.
- **Biology 2.0 Major GPA**: A minimum 2.0 average is required in all courses used to meet major requirements. A maximum of 3 credits of undergraduate research (BIOL 29400/49400/49900) may be factored into the Biology GPA calculation. Any excess Biology courses and research credits are "free electives" and not included in this calculation.

Course Requirements and Notes

- Students may earn no more than nine credits of graded (grades of A-F) research. This rule applies regardless of the subject under which credit was earned (BIOL, CHM, BTNY, etc.). Any additional research credits beyond nine must be pass/not pass grade mode. (Research courses include but are not limited to: ANSC 49100, ANTH 39000, ASL 39000, BCHM 49800, BIOL 29400, BIOL 49400, BIOL 49900, BTNY 49800, CHM 49900, EDPS 59000, ENTM 49700, FNR 49800, FS 49100, HDFS 39000, HORT 49100, NUTR 39000, PHRM 49500, PSY 39000, PUBH 49000, and SLHS 49800)
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior Credits: 2.00
- CHM 12901 - General Chemistry With A Biological Focus Credits: 5.00
- BIOL 13500 - First Year Biology Laboratory Credits: 2.00
- BIOL - 1450x (see above for currently available titles) Credit Hours: 2.00
- MA 16010 - Applied Calculus I Credits: 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (BIOL 11500 strongly recommended)

16-19 Credits

Spring 1st Year
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms Credits: 3.00 ♦
- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00 ♦
- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
- MA 16020 - Applied Calculus II Credits: 3.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Written Communication Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

16-20 Credits

Fall 2nd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 ♦
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00 ♦
- CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-16 Credits

Spring 2nd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 ♦
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- Science Core Selection - Credit Hours: 3.00

14 Credits

Fall 3rd Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- Neurobiology & Physiology Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

13 Credits
Spring 3rd Year

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00 or
  - PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
  - PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory Credit Hours: 1.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-2.00

14-16 Credits

Fall 4th Year

- Biology Selective - Credit Hours: 2.00-4.00
- Base Lab Requirement - Credit Hours: 1.00 - 4.00
- Great Issues Course Option - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-4.00
- Elective - Credit Hours: 0.00-2.00

12 Credits

Spring 4th Year

- Computing Selective - Credit Hours: 3.00 - 4.00 ♦
- Neurobiology & Physiology Selective 500 Level - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course
The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Minor

Biological Sciences Minor

Requirements for Minor (12-16 credits)

Part I (8 credits)

Cell Biology

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 or
- BIOL 23000 - Biology Of The Living Cell Credits: 3.00

Genetics and Molecular Biology

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00

Ecology and Evolution

- BIOL 28600 - Introduction To Ecology And Evolution Credits: 2.00

Part II (2-4 credits)

- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 36700 - Principles Of Development Credits: 2.00
- BIOL 38700 - Macromolecules Credits: 2.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
• BIOL 41600 - Viruses And Viral Disease Credits: 3.00
• BIOL 42000 - Eukaryotic Cell Biology Credits: 3.00
• BIOL 43600 - Neurobiology Credits: 3.00
• BIOL 43800 - General Microbiology Credits: 3.00
• BIOL 44400 - Human Medical Genetics Credits: 3.00
• BIOL 44600 - Molecular Bacterial Pathogenesis Credits: 3.00
• BIOL 47800 - Introduction To Bioinformatics Credits: 3.00
• BIOL 48100 - Eukaryotic Genetics Credits: 3.00
• BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
• BIOL 51101 - Intro To X-Ray Crystallography Credits: 3.00
• BIOL 51202 - Methods And Measures In Biophysical Chemistry Credits: 3.00
• BIOL 51600 - Molecular Biology Of Cancer Credits: 3.00
• BIOL 51606 - Pathways In Human Health And Disease Credits: 3.00
• BIOL 51700 - Molecular Biology: Proteins Credits: 2.00
• BIOL 52905 - Disease Ecology Credits: 3.00
• BIOL 53300 - Medical Microbiology Credits: 3.00
• BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action Credits: 3.00
• BIOL 53700 - Immunobiology Credits: 3.00
• BIOL 53800 - Molecular, Cellular, And Developmental Neurobiology Credits: 3.00
• BIOL 56200 - Neural Systems Credits: 3.00
• BIOL 56310 - Protein Bioinformatics Credits: 3.00
• BIOL 58000 - Evolution Credits: 3.00
• BIOL 58210 - Ecological Statistics Credits: 3.00
• BIOL 58601 - Ecology Credits: 3.00
• BIOL 58705 - Animal Communication Credits: 3.00
• BIOL 59200 - The Evolution Of Behavior Credits: 3.00

Part III Laboratory (2-4 credits)

To use BIOL 29400 research for Part III, 2 credits are required. Only 2 credits of BIOL research can count towards the minor and minor GPA.

• BIOL 20400 - Human Anatomy And Physiology Credits: 4.00
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00
• BIOL 29400 - Biology Research Credits: 1.00 to 4.00 (Credit hours: 2.00)

Notes

• A 2.0 or higher average is required in courses used to complete the minor.
• Before undertaking this minor, the student must establish the prerequisites for the required minor courses.
• All courses for this minor must be taken at Purdue University West Lafayette.

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Non-Degree

Base Lab Requirements for all Biology majors

Base Lab Requirement

Each student must complete an option from the "Required Course" list. Students must also satisfy Objectives A and B below, which can be met by courses, research, or a combination of the two.

Additional options exist and vary by semester; please contact the Biology Advising Office for current selections.

BIOL research (BIOL 49400 or BIOL 49900) can be used to satisfy Objectives A and/or B below with approval. The Research Mentor must approve research to meet one or both objectives. Consult with your academic advisor for the forms used to obtain Research Mentor approval for each objective.

If using research towards the BLR, a minimum of four credits of BIOL 49400 and/or BIOL 49900 (combined) must be earned in addition to research director approval.

Students who complete a Biology Honors Thesis automatically meet Objectives A and B with the approved thesis.

Microbiology and Health & Disease majors must use BIOL 43900 to meet this requirement.

Ecology, Evolution, and Environmental Biology majors must use BIOL 59500 "Laboratory in Ecology" to meet this requirement.

Chemical Biology & Biochemistry majors will use BIOL 49500/CHM 49000, "CBB Research Capstone," to meet this requirement.

Required Course

All students must take one of the following courses:

- BIOL 32800 - Principles Of Physiology Credits: 4.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00
- BIOL 44212 - Microscopy And Cell Biology Credits: 1.00
- BIOL 58602 - Laboratory In Ecology Credits: 1.00 (Formerly offered as BIOL 59500 Title = Laboratory In Ecology) Credit Hours: 1.00
Objective A - Research planning, literature review, writing

All students must meet Objective A by seeking approval to use research, or by completing one of the following courses.

- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58602 - Laboratory In Ecology Credits: 1.00 (Formerly offered as BIOL 59500 Title = Laboratory In Ecology) Credit Hours: 1.00

Objective B - Analysis, simulation, and presentation

All students must meet Objective B by seeking approval to use research, or by completing one of the following courses.

- BIOL 32101 - Experimental Design And Quantitative Analysis Honors Credits: 3.00
- BIOL 43900 - Laboratory In General Microbiology Credits: 2.00
- BIOL 44212 - Microscopy And Cell Biology Credits: 1.00
- BIOL 48300 - Great Issues: Environmental And Conservation Biology Credits: 3.00
- BIOL 51099 - Neural Mechanisms In Health And Disease Credits: 3.00
- BIOL 55101 - Theory Of Molecular Methods Credits: 3.00
- BIOL 58210 - Ecological Statistics Credits: 3.00
- BIOL 58602 - Laboratory In Ecology Credits: 1.00 (Formerly offered as BIOL 59500 Title = Laboratory In Ecology) Credit Hours: 1.00

- 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.

The Department of Chemistry offers a Bachelor of Science in Chemistry (ACS accredited), a Bachelor of Science and a minor in Chemistry. The department also offers an Honors program and the opportunity to participate in Cooperative Education Program.

**Honors Program**

The Department of Chemistry has an honors program for superior students. Participation can begin during the sophomore year, and a student will be assigned to advanced sections in chemistry courses. During the junior and senior years, a student engages in undergraduate research, participates in research seminars and completes honor courses. The undergraduate research experience (CHM 49900 or equivalent) is to be a minimum of six credits. In addition, the student must write an honor's thesis based on the CHM 49900 work. The faculty advisor will read the thesis and the student will give a presentation of the research.

Admission to the chemistry honors program must be made by the end of the junior year. The honors student is expected to achieve and maintain a scholastic graduation index of at least 3.40. Students fulfilling requirements of the chemistry honors program will be graduated "with honors in chemistry". The honors program has been approved by the Royal Society of Chemistry.

**Cooperative Education Program**

The Department of Chemistry participates in the Cooperative Education Program. This program requires five years and involves the option of 3 or 5 work period sessions, either semester or summer modules, with a cooperating company in the chemical industry. As a student gains experience, she or he is given increasingly responsible industrial assignments and receives more compensation. A student can enter the program meeting the following requirements: has completed two semesters of chemistry and has a chemistry index of 2.80. Information is available from the Coordinator of Cooperative Education in the Department of Chemistry. Check with your advisor for further information.

Department of Chemistry Website

**Faculty**

**Contact Information**

*Head:* Professor Chris Hrycyna  
*Graduate Admissions:* Dr. Stephen Hoffmann, Assistant Head  
*Undergraduate Information:* Dr. Christine Schertz  
*Webmaster:* 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.

**Bachelor of Science**
Chemistry, BS

About the Program

The Department of Chemistry has an outstanding record of accomplishment and innovation in research, education, outreach, and entrepreneurship. Our field offers extraordinary solutions during times of extraordinary challenge. Nearly every area of science, technology, and medicine has been revolutionized by fundamental discoveries at the molecular level.

The Chemistry major at Purdue University gives students the opportunity to learn from world-class scientists in state-of-the-art teaching laboratories. Our small faculty to student ratio allows students to enjoy a great deal of individualized attention. Chemistry also offers opportunities for 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 interested in chemistry who also want the freedom to pursue minors, certificates, or second majors in other areas. Common areas of interest include Forensic Sciences, Biology, Foreign Languages, Management, Psychology, and other Liberal Arts areas.

Chemistry Website

Chemistry Department Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements
All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses (57-63 credits)**

**Area A: Required Major Courses (35-37 credits)**

- CHM 12500 - Introduction To Chemistry I **Credits:** 5.00 ♦ or
- CHM 11500 - General Chemistry **Credits:** 4.00 ♦ (satisfies Science for core)
- CHM 12600 - Introduction To Chemistry II **Credits:** 5.00 or
- CHM 11600 - General Chemistry **Credits:** 4.00
- CHM 22400 - Introductory Quantitative Analysis **Credits:** 4.00
- CHM 24100 - Introductory Inorganic Chemistry **Credits:** 4.00
- CHM 26505 - Organic Chemistry I **Credits:** 3.00
- CHM 26605 - Organic Chemistry II **Credits:** 3.00
- CHM 37300 - Physical Chemistry I **Credits:** 3.00
- CHM 37301 - Physical Chemistry Laboratory I **Credits:** 1.00
- CHM 37400 - Physical Chemistry II **Credits:** 3.00
- CHM 34200 - Inorganic Chemistry **Credits:** 3.00 or
- CHM 43800 - Introduction To Molecular Biotechnology **Credits:** 3.00 or
- CHM 46200 - Intermediate Organic Chemistry **Credits:** 3.00

**Required Lab Selectives (3-6 credits)**

Choose one area from the following selectives. Courses cannot double count with Required Analytical Selectives.
- CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
- CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00

Area 1
Area 2
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00

Area 3
- CHM 26300 - Organic Chemistry Laboratory I Credits: 1.00 and
Choose one:
- CHM 26400 - Organic Chemistry Laboratory II Credits: 1.00
Choose one:
- CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
- CHM 43300 - Biochemistry Credits: 3.00 or
- CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00 and
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- CHM 32100 - Analytical Chemistry I Credits: 4.00 or
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00 or
- CHM 42400 - Instrumental Analysis Credits: 4.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 Undergraduate Research - Credit Hours: 1.00

Required Analytical Selective (4 credits)
Choose one.
- CHM 32100 - Analytical Chemistry I Credits: 4.00
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
- CHM 42400 - Instrumental Analysis Credits: 4.00

Required Calculus and Physics Courses (16-18 credits)
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory or
- PHYS 22100 - General Physics Credits: 4.00

Other Departmental /Program Course Requirements (22-38 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.
Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found HERE. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

- CS 15900 - C Programming Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

*Met with required major coursework (CHM 11500/11600; CHM 12500/12600).
Mathematics

*Met with required major coursework (MA 16100/16200; MA 16500/16600).

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies STS for core).

Statistics (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00

Team-Building and Collaboration

*Met with required major coursework (PHYS 17200).

Electives (19-41 credits)

GPA Requirements

- Students must earn a cumulative GPA of 2.0 in all CHM courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.
- Students may graduate with Honors in Chemistry distinction. An approved honors thesis and a min of 3.4 GPA are required. Consult your CHM advisor.

Course Requirements and Notes

- **Satisfies a Non-departmental Major Course Requirement
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Cannot dual major with Chemical Biology & Biochemistry, Biochemistry, Chemistry (ACS), BS or Chemistry, BS.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan
Fall 1st Year

- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 ♦ or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 ♦
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-19 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

14-17 Credits

Fall 2nd Year

- CHM 26505 - Organic Chemistry I Credits: 3.00 ♦
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 22000 - General Physics Credits: 4.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
16-17 Credits

Spring 2nd Year

- CHM 26605 - Organic Chemistry II Credits: 3.00
- CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
- CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Science Core Selection - Credit Hours: 3.00
- Required Lab Selective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 0.00-1.00

14-15 Credits

Fall 3rd Year

- CHM 32100 - Analytical Chemistry I Credits: 4.00 or
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-3.00

16-17 Credits

Spring 3rd Year

- CHM 34200 - Inorganic Chemistry Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 15900 - C Programming Credits: 3.00
- Great Issues In Science - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-4.00

12-13 Credits

Fall 4th Year

- CHM 37300 - Physical Chemistry I Credits: 3.00
- CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
• Science Core Selection - Credit Hours: 1.00-3.00
• Elective - Credit Hours: 1.00-4.00

12-13 Credits

Spring 4th Year

• CHM 37400 - Physical Chemistry II Credits: 3.00
• CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
• Required Lab Selective - Credit Hours: 2.00-3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 2.00 or 5.00
• Elective - Credit Hours: 0.00-4.00

12-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
Bachelor of Science in Chemistry

Biochemistry (Chemistry), BSCH

About the Program

The Department of Chemistry has an outstanding record of accomplishment and innovation in research, education, outreach, and entrepreneurship. Our field offers extraordinary solutions during times of extraordinary challenge. Nearly every area of science, technology, and medicine has been revolutionized by fundamental discoveries at the molecular level. The Biochemistry (Chemistry) major at Purdue University gives students the opportunity to learn from world-class scientists in state-of-the-art teaching laboratories. Our small faculty to student ratio allows students to enjoy a great deal of individualized attention. We also offer opportunities for cutting-edge undergraduate research in Biochemistry. This degree provides excellent preparation for medical, dental, or veterinary schools, and would particularly benefit those planning careers in medical research. The ACS Accredited Degree in Chemistry 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.

Biochemistry Website

Chemistry Department Major Change (CODO) Requirements

American Chemical Society Website

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second
majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses (81-86 credits)**

**Area A: Required Major Courses (48-50 credits)**

- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ or
- CHM 11500 - General Chemistry Credits: 4.00 ♦ (satisfies Science for core)
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 or
- CHM 11600 - General Chemistry Credits: 4.00
- CHM 26505 - Organic Chemistry I Credits: 3.00 ♦
- CHM 26605 - Organic Chemistry II Credits: 3.00
- CHM 26600 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00
- CHM 43300 - Biochemistry Credits: 3.00 or
- BCHM 56100 - General Biochemistry I Credits: 3.00
- CHM 43800 - Introduction To Molecular Biotechnology Credits: 3.00 or
- BCHM 56200 - General Biochemistry II Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00
• BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00 or
• BIOL 23000 - Biology Of The Living Cell Credits: 3.00
• BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00

Area B: Genetics Option (4-5 credits)

Choose one sequence:

• AGRY 32000 - Genetics Credits: 3.00 and
• AGRY 32100 - Genetics Laboratory Credits: 1.00
OR
• BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 and
• BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00

Area C: Required Lab Selectives (19-25 credits)

Choose one option below.

Option 1: Selectives (19-21 credits)

Choose one selection from each area.

   Area 1: Organic Chemistry (2 credits)
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
• CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00

   Area 2: Physical Chemistry (10-11 credits)
• CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
• CHM 37300 - Physical Chemistry I Credits: 3.00

• CHM 37400 - Physical Chemistry II Credits: 3.00 or
• CHM 34800 - Bioinorganic Chemistry Credits: 3.00

• CHM 37300 - Physical Chemistry I
• CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00

• CHM 37400 - Physical Chemistry II or
• CHM 24100 - Introductory Inorganic Chemistry

• CHM 37200 - Physical Chemistry Credits: 4.00
• Chemistry Foundational Selective - Credit Hours: 3.00

   Area 3: Additional Selectives (7-8 credits)
• CHM 22400 - Introductory Quantitative Analysis Credits: 4.00
  AND
• CHM 32100 - Analytical Chemistry I Credits: 4.00 or
• CHM 42400 - Instrumental Analysis Credits: 4.00
OR
- CHM 32700 - Bioanalytical Chemistry Credits: 4.00
- Chemistry Foundational Selectives - Credit Hours: 3.00

Option 2: Selectives (22-25 credits)

Area 1: Physical Chemistry (11-14 credits)
- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- CHM 37300 - Physical Chemistry I Credits: 3.00
- CHM 37400 - Physical Chemistry II Credits: 3.00

OR
- CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
OR
- CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
- CHM 34800 - Bioinorganic Chemistry Credits: 3.00
- CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
OR
- CHM 34800 - Bioinorganic Chemistry

- CHM 42400 - Instrumental Analysis Credits: 4.00
- CHM 32700 - Bioanalytical Chemistry Credits: 4.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00

Chemistry Foundational Selectives

- BIOL 39500 - Special Assignments Credits: 0.00 to 18.00 Title: Macromolecules - Credit Hours: 3.00; Research - Credit Hours: 3.00
- BIOL 41500 - Introduction To Molecular Biology Credits: 3.00
- CHM 34200 - Inorganic Chemistry Credits: 3.00
- CHM 46200 - Intermediate Organic Chemistry Credits: 3.00

Area D: Required Calculus and Physics Courses (20-22 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 ♦
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- MA 26100 - Multivariate Calculus Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Other Departmental /Program Course Requirements (21-57 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS
Composition & Presentation

Written Communication (3-4 credits)
Choose one course from the Written Communication list. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

- CS 15900 - C Programming Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)
Choose one from this list.

Laboratory Science
Met with required major coursework (CHM 11500/11600; CHM 12500/12600).

Mathematics

Met with required major coursework (MA 16100/16200; MA 16500/16600).

Multidisciplinary Experience** (0-3 credits)

Choose one from the Science Technology and Society list, excluding those on the College of Science No Count list (satisfies STS for core).

Statistics (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00

Team-Building and Collaboration

Met with required major coursework (PHYS 17200).

Electives (0-18 credits)

GPA Requirements

- Students must earn a cumulative GPA of 2.0 in all CHM courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.
- Students may graduate with Honors in Chemistry distinction. An approved honors thesis and a min of 3.4 GPA are required. Consult your CHM advisor.

Course Requirements and Notes

- **Satisfies a Non-departmental Major Course Requirement
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

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University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.

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• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Sample 4-Year Plan

Fall 1st Year

- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 ♦ or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 ♦
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-19 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

14-16 Credits

Fall 2nd Year

- CHM 26505 - Organic Chemistry I Credits: 3.00 ♦
- MA 26100 - Multivariate Calculus Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00

14 Credits

Spring 2nd Year

- CHM 26605 - Organic Chemistry II Credits: 3.00
- CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
- CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Science Core Selection- Credit Hours: 3.00
- Science Core Selection- Credit Hours: 3.00
15 Credits

Fall 3rd Year

- BIOL 23100 - Biology III: Cell Structure And Function Credits: 3.00
- BIOL 23200 - Laboratory In Biology III: Cell Structure And Function Credits: 2.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 - 2 credits recommended
- CHM 43300 - Biochemistry Credits: 3.00 or
- CHM 53300 - Introductory Biochemistry Credits: 3.00 or
- BCHM 56100 - General Biochemistry I Credits: 3.00
- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- Science Core Selection- Credit Hours: 3.00

17 Credits

Spring 3rd Year

- BIOL 24100 - Biology IV: Genetics And Molecular Biology Credits: 3.00 or
- AGRY 32000 - Genetics Credits: 3.00
- BIOL 24200 - Laboratory In Biology IV: Genetics And Molecular Biology Credits: 2.00 or
- AGRY 32100 - Genetics Laboratory Credits: 1.00
- CHM 43800 - Introduction To Molecular Biotechnology Credits: 3.00 or
- BCHM 56200 - General Biochemistry II Credits: 3.00 or
- CHM 53800 - Molecular Biotechnology Credits: 3.00
- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 - 2 credits recommended

15 Credits

Fall 4th Year

- CHM 37300 - Physical Chemistry I Credits: 3.00
- CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 (1.00 credit recommended)
- COM 21700 - Science Writing And Presentation Credits: 3.00
- CHM 32100 - Analytical Chemistry I Credits: 4.00 or
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 15900 - C Programming Credits: 3.00

16 Credits

Spring 4th Year
- CHM 34200 - Inorganic Chemistry Credits: 3.00
- CHM 37400 - Physical Chemistry II Credits: 3.00
- CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
- Science Core Selection - Credit Hours: 3.00
- Great Issues In Science - Credit Hours: 3.00

13 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

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The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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

Chemistry Department Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (68-75 credits)

Required Major Courses (42-44 credits)

- CHM 11500 - General Chemistry Credits: 4.00 ♦ (satisfies Science Selective for core) or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
- CHM 22400 - Introductory Quantitative Analysis Credits: 4.00
- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- CHM 26505 - Organic Chemistry I Credits: 3.00
- CHM 26605 - Organic Chemistry II Credits: 3.00
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00
- CHM 43300 - Biochemistry Credits: 3.00 or
- BCHM 56100 - General Biochemistry I Credits: 3.00
- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00

Required Selectives (10-13 credits)

Required Analytical Selective (4 credits)

Choose one.

- CHM 32100 - Analytical Chemistry I Credits: 4.00
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
- CHM 42400 - Instrumental Analysis Credits: 4.00
Upper Level Selective (3 credits)

Choose one.

- CHM 34200 - Inorganic Chemistry Credits: 3.00
- CHM 43800 - Introduction To Molecular Biotechnology Credits: 3.00
- CHM 46200 - Intermediate Organic Chemistry Credits: 3.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 Title: Undergraduate Research - Credit Hours: 3.00

Additional Selectives (3-6 credits)

Additional Selectives Option 1

Choose three. Courses cannot double count with Required Analytical Selectives.

- CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00 or
- CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00
  AND
  Choose one:
  - CHM 32100 - Analytical Chemistry I Credits: 4.00
  - CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
  - CHM 33901 - Biochemistry Laboratory Credits: 1.00
  - CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
  - CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
  - CHM 42400 - Instrumental Analysis Credits: 4.00
  - CHM 49900 - Special Assignments Credits: 1.00 to 5.00 Title: Undergraduate Research - Credit Hours: 1.00

Additional Selectives Option 2 (3-6 credits)

Choose three. Courses cannot double count with Required Analytical Selectives.

- CHM 33901 - Biochemistry Laboratory Credits: 1.00
- CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
- CHM 32100 - Analytical Chemistry I Credits: 4.00 or
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00 or
- CHM 42400 - Instrumental Analysis Credits: 4.00
- CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
- CHM 49900 - Special Assignments Credits: 1.00 to 5.00 Title: Undergraduate Research - Credit Hours: 1.00

Required Calculus and Physics Courses (16-18 credits)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and
• PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Other Departmental /Program Course Requirements (21-57 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found HERE. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science

Met with required major coursework (CHM 11500/11600; CHM 12500/12600).

Mathematics

Met with required major coursework (MA 16100/16200; MA 16500/16600).

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00

Team-Building and Collaboration

Met with required major coursework (PHYS 17200).

Electives (7-30 credits)

GPA Requirements

- Students must earn a cumulative GPA of 2.0 in all CHM courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.
- Students may graduate with Honors in Chemistry distinction. An approved honors thesis and a min of 3.4 GPA are required. Consult your CHM advisor.

Course Requirements and Notes

- **Satisfies a Non-departmental Major Course Requirement
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Cannot dual major with Chemical Biology & Biochemistry, Biochemistry, Chemistry (ACS), BS or Chemistry, BS.

College of Science Pass/No Pass Option Policy
• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).
Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CHM 19400 - Freshman Chemistry Orientation Credits: 1.00
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ or
- CHM 11500 - General Chemistry Credits: 4.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-19 Credits

Spring 1st Year

- PHYS 17200 - Modern Mechanics Credits: 4.00
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 or
- CHM 11600 - General Chemistry Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-18 Credits

Fall 2nd Year

- CHM 26505 - Organic Chemistry I Credits: 3.00
- CHM 29400 - Sophomore Chemistry Seminar Credits: 1.00
- CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00 or
- CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 3.00

14-16 Credits

Spring 2nd Year

- CHM 22400 - Introductory Quantitative Analysis Credits: 4.00
- CHM 26605 - Organic Chemistry II Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-2.00

13-15 Credits

Fall 3rd Year

- CHM 37300 - Physical Chemistry I Credits: 3.00
- CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
- CHM 32100 - Analytical Chemistry I Credits: 4.00 or
- CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
- CS 15900 - C Programming Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00

14-15 Credits

Spring 3rd Year

- CHM 37400 - Physical Chemistry II Credits: 3.00
- CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-5.00
- Elective - Credit Hours: 0.00-3.00
12-18 Credits

Fall 4th Year

- CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00
- CHM 43300 - Biochemistry Credits: 3.00 or
- BCHM 56100 - General Biochemistry I Credits: 3.00
- CHM 49400 - Junior-Senior Chemistry Seminar Credits: 1.00
- Great Issues In Science Option - Credit Hours: 3.00
- Additional Selective - Credit Hours: 1.00-3.00

12-14 Credits

Spring 4th Year

- CHM 34200 - Inorganic Chemistry Credits: 3.00
- CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
- Additional Selective - Credit Hours: 2.00-3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Upper Level Selective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00-5.00

15 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Minor

Chemistry Minor

Requirements for the Minor (16 credits)

Requirements for the minor can be completed in two ways: (1) a combination of courses from Area 1 (1-10 credits) and Area 2 (6-15 credits) to equal 16 credits or (2) courses from just Area 2 (16 credits total). Before undertaking this minor, the student must establish the prerequisites for the required minor courses.

Area 1 Organic Chemistry (maximum 10 credits)

Only one course in each Part can count toward the minor.

Part I

- CHM 25500 - Organic Chemistry For The Life Sciences I Credits: 3.00
- CHM 26100 - Organic Chemistry I Credits: 3.00
- CHM 26505 - Organic Chemistry I Credits: 3.00
- PHSC 20400 - Organic Chemistry I Credits: 3.00 *

Part II

- CHM 25600 - Organic Chemistry For The Life Sciences II Credits: 3.00
- CHM 26200 - Organic Chemistry II Credits: 3.00
- CHM 26605 - Organic Chemistry II Credits: 3.00
- PHSC 20500 - Organic Chemistry II Credits: 3.00 *

Part III

- CHM 25501 - Organic Chemistry For The Life Sciences Laboratory I Credits: 1.00
• CHM 26300 - Organic Chemistry Laboratory I Credits: 1.00
• CHM 26500 - Organic Chemistry Laboratory I Credits: 2.00
• CHM 26700 - Organic Chemistry Laboratory I Honors Credits: 2.00

Part IV

• CHM 25601 - Organic Chemistry For The Life Sciences Laboratory II Credits: 1.00
• CHM 26400 - Organic Chemistry Laboratory II Credits: 1.00
• CHM 26600 - Organic Chemistry Laboratory II Credits: 2.00
• CHM 26800 - Organic Chemistry Laboratory II Honors Credits: 2.00

Area 2 Additional Selectives

• BCHM 56100 - General Biochemistry I Credits: 3.00 or
• CHM 33900 - Biochemistry: A Molecular Approach Credits: 3.00 or
• CHM 43300 - Biochemistry Credits: 3.00 or
• CHM 53300 - Introductory Biochemistry Credits: 3.00
• CHM 32100 - Analytical Chemistry I Credits: 4.00 or
• CHM 32300 - Analytical Chemistry I Honors Credits: 4.00
• CHM 37000 - Topics In Physical Chemistry Credits: 3.00 or
• CHM 37400 - Physical Chemistry II Credits: 3.00
• CHM 37200 - Physical Chemistry Credits: 4.00 or
• CHM 37300 - Physical Chemistry I Credits: 3.00
• CHM 24100 - Introductory Inorganic Chemistry Credits: 4.00 or
• CHM 34800 - Bioinorganic Chemistry Credits: 3.00
• CHM 33901 - Biochemistry Laboratory Credits: 1.00
• CHM 34200 - Inorganic Chemistry Credits: 3.00
• CHM 34201 - Inorganic Chemistry Laboratory Credits: 1.00
• CHM 37301 - Physical Chemistry Laboratory I Credits: 1.00
• CHM 37401 - Physical Chemistry Laboratory II Credits: 1.00
• CHM 42400 - Instrumental Analysis Credits: 4.00
• CHM 43800 - Introduction To Molecular Biotechnology Credits: 3.00
• CHM 46200 - Intermediate Organic Chemistry Credits: 3.00
• CHM 48100 - Environmental Chemistry Credits: 3.00
• CHM 49900 - Special Assignments Credits: 1.00 to 5.00 (up to 3 credits)
• CHM 51300 - Chemical Literature Credits: 1.00
• CHM 56000 - Organic Spectroscopic Analysis Credits: 3.00
• CHM 57900 - Computational Chemistry Credits: 3.00
• CHM 58100 - Atmospheric Chemistry Credits: 3.00

Notes

• No more than three (3) credits of CHM 49900 can be applied to the minor.
• *In Area I, MCMP 20400 will count as courses from both Parts I and III; and MCMP 20500 will count as courses from both Parts II and IV.
• To qualify for the minor, classes must be completed with a cumulative GPA of 2.0 or better.
• The P/NP Option is not available for courses in this minor.
- All courses for this minor must be taken at Purdue University West Lafayette.
- Study Abroad CHM courses approved by the Department of Chemistry will be allowed to meet the minor requirements.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

- 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 artificial intelligence and machine learning, security and cryptography, software engineering, networking, operating systems, graphics and animation, competitive programming, distributed systems, information systems, and bioinformatics. Computer Science graduates pursue careers in software engineering, data science, systems development, animation and visualization, computational finance, consulting, information security, wireless systems, embedded systems, and biotechnology. Many also go on to graduate or professional school in areas such as engineering, business, law, or medicine.

The Department also offers a Data Science program. A major in data science puts graduates at the forefront of an emerging field and prepares them for an exciting career at the intersection of computer science and statistics. Data Science is the interdisciplinary field of inquiry that uses quantitative and analytical methods to help gain insights and predictions based on big data. Students learn about key computational methods and statistical techniques and develop the deep analytical thinking skills needed to reason reliably, intelligently and creatively from data. The vast amounts of data generated every day has created a data-rich and data-driven world. The data science major opens pathways to careers in virtually every area of society, from healthcare, security and sustainability to education, business and economics.

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, five 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 is used for a variety of purposes, including notices of campus events, workshop and colloquium speakers, news and information, sporting events, research demonstrations, and class projects.

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.
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.

Bachelor of Science

Artificial Intelligence, BS

About the Program

Artificial Intelligence (AI) systems are increasingly being deployed for real-world tasks. Students in the AI major will master the foundations and tools for building and understanding artificial intelligence systems which reason about data, correct themselves, and make decisions. Students will explore the link between cognitive psychology, neuroscience, and AI, as well as the ethics of AI, which are integral to a holistic understanding of AI. The major will open pathways to new careers ranging from healthcare and sustainability to business and economics.

Artificial Intelligence (College of Science)

Computer Science Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses (62-63 credits)**

Must have a C or better in all courses.

**Required Major Courses (50-51 credits)**

Must have a C or better in all courses.

- **CS 17600 - Data Engineering In Python** Credits: 3.00
- **CS 18000 - Problem Solving And Object-Oriented Programming** Credits: 4.00
- **CS 18200 - Foundations Of Computer Science** Credits: 3.00
- **CS 24300 - Artificial Intelligence Basics** Credits: 3.00
- CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- PSY 12000 - Elementary Psychology Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00
- PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00 or
- PHIL 20800 - Ethics Of Data Science Credits: 3.00
- PHIL 22100 - Introduction To Philosophy Of Science Credits: 3.00 or
- PHIL 32200 - Philosophy Of Technology Credits: 3.00
- PSY 20000 - Introduction To Cognitive Psychology Credits: 3.00 or
- PSY 22200 - Introduction To Behavioral Neuroscience Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00

CS Selective I (6 credits)

Must have a C or better in all courses. Choose two:

- CS 43900 - Introduction To Data Visualization Credits: 3.00
- CS 44000 - Large Scale Data Analytics Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 47500 - Human-Computer Interaction Credits: 3.00
- CS 57700 - Natural Language Processing Credits: 3.00
- CS 45800 - Introduction To Robotics Credits: 3.00

CS Selective II (3 credits)

Must have a C or better in all courses. Choose one:

- CS 34800 - Information Systems Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
- CS 52300 - Social, Economic, And Legal Aspects Of Security Credits: 3.00
- CS 52900 - Security Analytics Credits: 3.00

Philosophy Selective (3 credits)

Must have a C or better in all courses. Choose one:

- PHIL 30300 - History Of Modern Philosophy Credits: 3.00
- PHIL 43200 - Theory Of Knowledge Credits: 3.00
- PHIL 43500 - Philosophy Of Mind Credits: 3.00
Other Departmental/Program Course Requirements (20-37 Credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

Computing (0 credits)

Met with CS 17600.

Cultural Diversity (Language & Culture)^* (0-6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - fulfilled by PHIL 20700 or PHIL 20800.
- Language & Culture Option II
- Language & Culture Option III

General Education^ (0 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- Met with PHIL 22100 or PHIL 32200.
- Met with PSY 12000.
- Met with PSY 20000 or PSY 22200.

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).
Laboratory Science Option I
Laboratory Science Option II

Mathematics (8-10 credits)
(satisfies Quantitative Reasoning for core) - Must have C or better

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science, Technology, and Society^* (0 credits)
Met with PHIL 20700 or PHIL 20800 or PHIL 22100. (satisfies Science, Technology, Society for core)

Statistics (0 credits)
Met with STAT 35000 or STAT 51100.

Team-Building and Collaboration (0 credits)
Met with CS 18000.

Electives (20-38 credits)

Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 17600. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

For this degree, all major required courses, all major electives (selectives), and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-year Plan

All Major core courses and Major elective requirements, regardless of department, must be completed with a grade of "C" or higher. All prerequisites to Major core courses and Major elective requirements, regardless of department, must be completed with a grade of C or higher.

Fall 1st Year

- CS 17600 - Data Engineering In Python Credits: 3.00
- PSY 12000 - Elementary Psychology Credits: 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 1.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- CS 18200 - Foundations Of Computer Science Credits: 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- PSY 20000 - Introduction To Cognitive Psychology Credits: 3.00 or
- PSY 22200 - Introduction To Behavioral Neuroscience Credits: 3.00

14-15 Credits

Fall 2nd Year

- CS 24300 - Artificial Intelligence Basics Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00
- PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00 or
- PHIL 20800 - Ethics Of Data Science Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
16-18 Credits

Spring 2nd Year

- CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
- MA 26500 - Linear Algebra Credits: 3.00
  OR
- MA 41600 - Probability Credits: 3.00
  OR
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- STAT 41600 - Probability Credits: 3.00
- PHIL 22100 - Introduction To Philosophy Of Science Credits: 3.00
  OR
- PHIL 32200 - Philosophy Of Technology Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Fall 3rd Year

- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS Selective I - Credit Hours: 3.00
- Philosophy Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-17 Credits

Spring 3rd Year

- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- CS Selective I - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 3.00
15-17 Credits

Spring 4th Year

- CS Selective II - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Algorithmic Foundations, BS

About the Program
Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Honors Major Courses (58-63 credits)

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Algorithmic Foundations Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00 or
Selectives

Must have a "C" or better in all courses. Choose three.

- **CS 31100** - Competitive Programming II **Credits:** 2.00
- **CS 41100** - Competitive Programming III **Credits:** 2.00 *The combination of CS 31100 and CS 41100 satisfies one selective.*
- **CS 31400** - Numerical Methods **Credits:** 3.00
- **CS 33400** - Fundamentals Of Computer Graphics **Credits:** 3.00
- **CS 35300** - Principles Of Concurrency And Parallelism **Credits:** 3.00
- **CS 35500** - Introduction To Cryptography **Credits:** 3.00
- **CS 44800** - Introduction To Relational Database Systems **Credits:** 3.00
- **CS 45600** - Programming Languages **Credits:** 3.00
- **CS 45800** - Introduction To Robotics **Credits:** 3.00
- **CS 48300** - Introduction To The Theory Of Computation **Credits:** 3.00
- **CS 49000** - Topics In Computer Sciences For Undergraduates **Credits:** 1.00 to 5.00
- **MA 34100** - Foundations Of Analysis **Credits:** 3.00 or
- **MA 35301** - Linear Algebra II **Credits:** 3.00 or
- **MA 36200** - Topics In Vector Calculus **Credits:** 3.00 or
- **MA 36600** - Ordinary Differential Equations **Credits:** 4.00 or
- **MA 38500** - Introduction To Logic **Credits:** 3.00 or
- **MA 42100** - Linear Programming And Optimization Techniques **Credits:** 3.00 or
- **MA 45300** - Elements Of Algebra I **Credits:** 3.00 or
- One three-credit computer science course at the 300, 400, 500 level* or an independent study course approved by the track chair.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a "C" or better in all courses.

- **CS 39700** - Honors Seminar **Credits:** 0.00
- **CS 49700** - Honors Research Project **Credits:** 3.00 (may use for Track Elective - see Track chairperson for approval)
- **MA 35301** - Linear Algebra II **Credits:** 3.00 or
- **MA 41600** - Probability **Credits:** 3.00 or
- **MA 51800** - Advanced Discrete Mathematics **Credits:** 3.00 or
- An approved MA course with course number higher than **MA 35100** - Elementary Linear Algebra **Credits:** 3.00 or
- An approved STAT course with course number higher than **STAT 51100** - Statistical Methods **Credits:** 3.00
- **CS 50000** level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
- Three out of the four following courses: **CS 35400**, **CS 35200**, **CS 38100**, ECE 27000, **CS 35400**, **CS 35200**, and **CS 38100** may be used to meet track requirements if the courses are required or electives for the student's track.
Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III
Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a "C" or better. or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a "C" or better.

Science Technology and Society^* (1-3 credits)

Choose one from the Science, Technology and Society list here (satisfies Science, Technology, and Society for core)

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)

Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.
GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements and Notes

- The use of any Variable Title course must be approved by the faculty.
- Use of 300, 400, and 500 level CS courses outside of track or an independent study course to count as a track elective requires track chair approval.
- Non-CS courses and graduate level courses may have additional prerequisites that must be met in order to be eligible to take the course.
- No more than one Math course may be counted toward the Electives.
- No course can be counted both for a required and selective course within the same track.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Program Requirements

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ***
- CS 24000 - Programming In C Credits: 3.00 ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700)
- Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 35100 - Elementary Linear Algebra Credits: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00 *** or
- MA 41600 - Probability Credits: 3.00 *** or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
- An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
- An approved MA course with a course number higher than STAT 51100***
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00
- Algorithmic Foundations Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (Recommended CS 39100)
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

• CS 49700 - Honors Research Project Credits: 3.00
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• CS 50000 level - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course
The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

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The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Computational Science and Engineering, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, and problem-solving skills and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. This concentration is intended to introduce computer science basics in Computational Science and Engineering (CS&E). Students not intending to pursue an advanced degree are advised to choose Option 1 for electives and to take courses in some area of pure or applied science with the objective of learning how to develop software useful for the chosen area. Students intending to pursue an advanced degree are advised to choose Option 2 for electives and also to take the following courses: Physics lab science courses; MA 35100 rather than MA 26500, MA 36200 or MA 44200; MA 36600 rather than MA 26600, MA 34100, or MA 44000.

Degree Requirements

120 Credits Required
Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Honors Major Courses (58-63 credits)

Must have a "C" or better in all courses.
Required CS Honors Major Math Courses (7-8 credits)

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Computational Science and Engineering Concentration (21-22 credits)

Must have a "C" or better in all courses.

Required Courses (9-10 credits)

Must have a "C" or better in all courses.

- CS 31400 - Numerical Methods Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- MA 26600 - Ordinary Differential Equations Credits: 3.00 or
- MA 36600 - Ordinary Differential Equations Credits: 4.00

Applications (3 credits)

Must have a "C" or better in all courses. Choose one.

- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 47800 - Introduction To Bioinformatics Credits: 3.00
- ECE 30100 - Signals And Systems Credits: 3.00
- IE 33600 - Operations Research - Stochastic Models Credits: 3.00

Systems (3 credits)

Must have a "C" or better in all courses. Choose one.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
• CS 35400 - Operating Systems Credits: 3.00

Selectives (6 credits)

Must have a "C" or better in all courses. Choose two.

• CS 30700 - Software Engineering I Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00
• CS 45600 - Programming Languages Credits: 3.00
• CS 45800 - Introduction To Robotics Credits: 3.00
• CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00
• CS 51500 - Numerical Linear Algebra Credits: 3.00
• CS 52000 - Computational Methods In Optimization Credits: 3.00
• CS 52500 - Parallel Computing Credits: 3.00
• IE 33500 - Operations Research - Optimization Credits: 3.00
• MA 34100 - Foundations Of Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00

Concentration Notes

• At least four (4) of the seven (7) courses for Computational Science and Engineering track must be CS courses.
• Any course beyond the one required class from the list of Applications/Systems courses counts as an elective.
• Non-CS courses and graduate level courses may have additional prerequisites that must be met to be eligible to take the course.
• No course may be counted for both a required and selective course within the same track.

Required CS Honors (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a "C" or better in all courses.

• CS 39700 - Honors Seminar Credits: 0.00
• CS 49700 - Honors Research Project Credits: 3.00 (may use for Concentration Selective - see chairperson for approval)
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 41600 - Probability Credits: 3.00 or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
• An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
• An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00
• CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
• Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)
COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)
Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

*(satisfies Quantitative Reasoning for core)*

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 must have C or better. or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00 must have C or better.

**Science Technology and Society^* (1-3 credits)**

Choose one from the Science, Technology and Society list here *(satisfies Science, Technology, and Society for core)*

**Statistics (3 credits)**

Must have a C or better in all courses.

- STAT 35000 - Introduction To Statistics **Credits:** 3.00 ♦ or
- STAT 51100 - Statistical Methods **Credits:** 3.00 ♦

**Team-Building and Collaboration**

*Met with required major coursework.*

**Electives (2-30 credits)**

Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

**Grade Requirements**

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

**GPA Requirements**
3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Enrollment in freshman seminar course CS 19300 is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ***
- CS 24000 - Programming In C Credits: 3.00 ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700 )
- Electives - Credit Hours: 1.00

15-17 Credits
Fall 2nd Year

- CS 25000 - Computer Architecture **Credits: 4.00***
- CS 25100 - Data Structures And Algorithms **Credits: 3.00***
- MA 26100 - Multivariate Calculus **Credits: 4.00 or
d- MA 27101 - Honors Multivariate Calculus **Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming **Credits: 4.00***
- MA 35100 - Elementary Linear Algebra **Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- MA 35301 - Linear Algebra II **Credits: 3.00*** or
- MA 41600 - Probability **Credits: 3.00*** or
- MA 51800 - Advanced Discrete Mathematics **Credits: 3.00*** or
- An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra **Credits: 3.00*** or
- An approved MA course with a course number higher than STAT 51100***
- STAT 35000 - Introduction To Statistics **Credits: 3.00♦ or
- STAT 51100 - Statistical Methods **Credits: 3.00
- Computational Science and Engineering Concentration course - Credit Hours: 3.00*** (Suggested CS 35200)
- Computational Science and Engineering Concentration course - Credit Hours: 3.00***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (Recommended CS 39100)

16-17 Credits

Spring 3rd Year

- Computational Science and Engineering Concentration course - Credit Hours: 3.00*** (Suggested CS 35400)
- Computational Science and Engineering Concentration course - Credit Hours: 3.00***
- Great Issues In Science - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
15-16 Credits

Fall 4th Year

- CS 39700 - Honors Seminar Credits: 0.00
- Computational Science and Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
- Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

- CS 49700 - Honors Research Project Credits: 3.00
- Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
- CS 50000 level - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."
Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Computer Graphics and Visualization, BS

About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

The Computer Graphics and Visualization concentration is designed to prepare students for work and/or for graduate school in computer graphics, visualization, and related areas. Computer graphics refers to modeling (including 3D acquisition) and rendering 3D objects and scenes. Visualization refers to using imagery to convey digital information and facilitate its interpretation and analysis. Jobs and activities for students graduating from this track may include:

- Graphics-related Industry jobs (e.g., Intel, NVIDIA, Microsoft, Adobe, IBM, Google) - working on graphics software, hardware, and applications.
- CAD and Architectural Applications - developing CAD/Engineering/Architecture related applications.
- Movie Industry (e.g., Pixar, Dreamworks, Disney, Sony) - working on creating movies and related tools.
- Gaming Industry (e.g., Electronic Arts, Midway Games, Disney, Sony) - working on game programming and related tools.
- Laboratories - working in one of several scientific visualization laboratories (though often a graduate degree is preferred).
- Graduate school - continuing studies towards a MS or PhD which opens up other job opportunities including research labs and academic positions.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Curriculum and Degree Requirements for College of Science
A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Degree Requirements**

**120 Credits Required**

**Computer Science Honors Major Courses (58-63 credits)**
Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

**Required CS Major Core Courses (21 credits)**

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

**Computer Graphics and Visualization Concentration (18 credits)**

Must have a "C" or better in all courses.

**Required Courses**

Must have a "C" or better in all courses. Choose three courses.

- CS 31400 - Numerical Methods Credits: 3.00
- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
- CS 43400 - Advanced Computer Graphics Credits: 3.00 or
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00

**Selectives**

Must have a "C" or better in all courses. Choose three courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
- CS 43400 - Advanced Computer Graphics Credits: 3.00
- CS 43900 - Introduction To Data Visualization Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 45800 - Introduction to Robotics **Credits:** 3.00
- CS 47100 - Introduction to Artificial Intelligence **Credits:** 3.00
- CS 49000 - Topics in Computer Sciences for Undergraduates **Credits:** 1.00 to 5.00 Title: Introduction to VR/AR - Credit Hours: 3.00

**Project Option**

Electives could include 1 semester of CS 49000 project course with CGVLAB.

This option is very useful to undergraduate students involved in research, and such is beneficial to both job-seeking and graduate-school seeking students.

**Concentration Notes**

- No course may be counted for both a required and selective course within the same track.
- Electives could include one semester of CS 49000 project with CGVLAB with Chair approval.

**Required CS Honors (12-13 credits)**

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a "C" or better in all courses.

- CS 39700 - Honors Seminar **Credits:** 0.00
- CS 49700 - Honors Research Project **Credits:** 3.00 (may use for Track Elective - see Track chairperson for approval)
- MA 35301 - Linear Algebra II **Credits:** 3.00 or
- MA 41600 - Probability **Credits:** 3.00 or
- MA 51800 - Advanced Discrete Mathematics **Credits:** 3.00 or
- An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra **Credits:** 3.00 or
- An approved STAT course with course number higher than STAT 51100 - Statistical Methods **Credits:** 3.00
- CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
- Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

**Other Departmental/Program Course Requirements (32-55 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

- Labeled as a Science Core Selection in the four year plan of study
- Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**Written Communication (3-4 credits)**

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)
Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)
MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better) or
MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better)

Science Technology and Society^* (1-3 credits)
Choose one from the Science, Technology and Society list here (satisfies Science, Technology, and Society for core)

Statistics (3 credits)
Must have C or better in all courses.
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration
Met with required major coursework.

Electives (2-30 credits)
Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements
- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements
- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy
- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ***
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 ***
• CS 24000 - Programming In C Credits: 3.00 ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 (Recommended CS 19700 )
• Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• MA 35301 - Linear Algebra II Credits: 3.00 *** or
• MA 41600 - Probability Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100***
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits
Spring 4th Year

- CS 49700 - Honors Research Project Credits: 3.00
- Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
- CS 50000 level - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Database and Information Systems, BS
About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project). Database and Information Systems is designed to prepare students to become computer scientists who understand and can apply the principles and techniques of database design, algorithms for information retrieval, their strengths and limitations, and tools for the design of databases and information systems.

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Honors Major Courses (58-63 credits)**

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra **Credits:** 3.00
- MA 26100 - Multivariate Calculus **Credits:** 4.00 or
- MA 27101 - Honors Multivariate Calculus **Credits:** 5.00

**Required CS Major Core Courses (21 credits)**

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science **Credits:** 3.00 ♦
- CS 24000 - Programming In C **Credits:** 3.00 ♦
- CS 25000 - Computer Architecture **Credits:** 4.00
- CS 25100 - Data Structures And Algorithms **Credits:** 3.00
- CS 25200 - Systems Programming **Credits:** 4.00

**Database and Information Systems Concentration (21 credits)**

Must have a "C" or better in all courses.

**Required Courses**
Must have a "C" or better in all courses.

- CS 34800 - Information Systems Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
- CS 47300 - Web Information Search And Management Credits: 3.00

Selectives

Choose one course from each of the following categories. Must have a "C" or better in all courses.

Category I - Computing Systems

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00

Category II - Information Assurance

- CS 35500 - Introduction To Cryptography Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00

Category III - Related Studies

- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 47800 - Introduction To Bioinformatics Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
  Senior Project Option:
  - CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - (Senior Project)
  or
  - EPCS 41100 - Senior Design Participation In EPICS Credits: 1.00 and
  - EPCS 41200 - Senior Design Participation In EPICS Credits: 2.00 - (Senior Project)
  or
  - CS 49700 - Honors Research Project Credits: 3.00

Concentration Notes

- No course may be counted for both a required and selective course within the same track.
- Senior Project (CS 49000/CS 49700) must be taken for at least three credits, be supervised by CS faculty & approved by DBIS chair.

Required CS Honors (12-13 credits)
Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a C or better in all courses.

- CS 39700 - Honors Seminar Credits: 0.00
- CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
- MA 35301 - Linear Algebra II Credits: 3.00 or
- MA 41600 - Probability Credits: 3.00 or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
- An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
- An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00 or
- CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
- Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

*(satisfies Quantitative Reasoning for core)*

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a C or better or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a C or better.

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration
Electives (2-30 credits)

Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements
For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year
• CS 18200 - Foundations Of Computer Science **Credits: 3.00 ***
• CS 24000 - Programming In C **Credits: 3.00 ***
• MA 16200 - Plane Analytic Geometry And Calculus II **Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II **Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 (Recommended CS 19700)
• Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture **Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms **Credits: 3.00 ***
• MA 26100 - Multivariate Calculus **Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus **Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming **Credits: 4.00 ***
• MA 35100 - Elementary Linear Algebra **Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• MA 35301 - Linear Algebra II **Credits: 3.00 *** or
• MA 41600 - Probability **Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics **Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra **Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100***
• STAT 35000 - Introduction To Statistics **Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods **Credits: 3.00
• Database and Information Systems Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
• Database and Information Systems Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
16-17 Credits

Spring 3rd Year

- Database and Information Systems Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
- Database and Information Systems Concentration course - Credit Hours: 3.00 ***
- Great Issues In Science - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

- CS 39700 - Honors Seminar Credits: 0.00
- Database and Information Systems Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
- Database and Information Systems Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

- CS 49700 - Honors Research Project Credits: 3.00
- Database and Information Systems Concentration course - Credit Hours: 3.00 ***
- CS 50000 level - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-
Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Machine Intelligence, BS

About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment. Machine Intelligence is designed to prepare students to work in fields related to management and analysis of data, including areas such as machine learning, information retrieval, and data mining. The track is designed to prepare students to understand, and effectively apply in practice, the principles and techniques of data and knowledge representation, search, as well as learning and reasoning with data.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Degree Requirements

120 Credits Required
Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Honors Major Courses (58-63 credits)

Must have "C" or better in all courses.
Required CS Honors Major Math Courses (7-8 credits)

Must have "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Machine Intelligence Concentration (18 credits)

Must have C or better in all courses.

Required Courses (4 courses)

- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00 or
- CS 47300 - Web Information Search And Management Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51200 - Applied Regression Analysis Credits: 3.00

Selectives (2 courses)

- CS 31400 - Numerical Methods Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 45800 - Introduction To Robotics Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 57700 - Natural Language Processing Credits: 3.00
- CS 57800 - Statistical Machine Learning Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
• CS 43900 - Introduction To Data Visualization Credits: 3.00 or
• CS 44000 - Large Scale Data Analytics Credits: 3.00 or
• CS 47500 - Human-Computer Interaction Credits: 3.00

Concentration Notes

• Non-CS courses and graduate level courses may have additional prerequisites that must be met to be eligible to take the course.
• No course may be counted for both a required and selective course within the same track.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a C or better in all courses

• CS 39700 - Honors Seminar Credits: 0.00
• CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 41600 - Probability Credits: 3.00 or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
• An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
• An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00 or
• CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
• Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

*(satisfies Quantitative Reasoning for core) Must have a C or better.*

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 or
- MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00
Science, Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here *(satisfies Science, Technology, Society for core)*

Statistics (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)

*Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 19700, CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.*

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan
Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 *** ♦
- CS 24000 - Programming In C Credits: 3.00 *** ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700 )
- Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year
• MA 35301 - Linear Algebra II Credits: 3.00 *** or
• MA 41600 - Probability Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100***
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00
• Machine Intelligence Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Machine Intelligence Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Machine Intelligence Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Machine Intelligence Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Machine Intelligence Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

• CS 49700 - Honors Research Project Credits: 3.00
• Machine Intelligence Concentration course - Credit Hours: 3.00 ***
• CS 50000 level - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Programming Language, BS

About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project). This concentration is designed to prepare students to work in fields related to program understanding, manipulation and transformation. This includes run-time system engineering as well as domain specific techniques (e.g., real-time computing or web programming). They will acquire tools and techniques needed to specify and implement language-based solutions.
Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience
Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Honors Major Courses (58-63 credits)

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Programming Language Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose 3.

- CS 30700 - Software Engineering 1 Credits: 3.00 or
- CS 40800 - Software Testing Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00 or
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
- CS 56000 - Reasoning About Programs Credits: 3.00
- MA 38500 - Introduction To Logic Credits: 3.00 or
- MA 45300 - Elements Of Algebra I Credits: 3.00

Concentration Notes

- No course may be counted for both a required and selective course within the same track.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a C or better in all courses.

- CS 39700 - Honors Seminar Credits: 0.00
- CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
- MA 35301 - Linear Algebra II Credits: 3.00 or
- MA 41600 - Probability Credits: 3.00 or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
- An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
- An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00 or
- CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00 or
- Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)
Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

**Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

### Computing

*Met with required major coursework.*

### Cultural Diversity (Language & Culture)* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

### General Education* (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

### Great Issues In Science (3 credits)

Choose one from this list.

### Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

### Mathematics (8-10 credits)

*(satisfies Quantitative Reasoning for core)*

- **MA 16100 - Plane Analytic Geometry And Calculus I** **Credits:** 5.00 (must have C or better to meet prerequisite for CS 18200) or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a C or better or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a C or better.

Science Technology & Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Must have a "C" or better in all courses.

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)

Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

• All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

• 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ***
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 ***
• CS 24000 - Programming In C Credits: 3.00 ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 (Recommended CS 19700 )
• Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• MA 35301 - Linear Algebra II Credits: 3.00 *** or
• MA 41600 - Probability Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100***
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00
• Programming Language Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200 )
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Programming Language Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Programming Language Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Programming Language Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Programming Language Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits
Spring 4th Year

- CS 49700 - Honors Research Project Credits: 3.00
- Programming Language Concentration course - Credit Hours: 3.00 ***
- CS 50000 level - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Security, BS
About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

The Security track is designed to prepare students to become computer scientists who:

- understand the importance of and are capable of designing and developing secure software,
- are familiar with the societal impact of insecure software and related infrastructure, and
- are familiar with and can use techniques for testing and assessing systems for secure operation.

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements
All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Honors Major Courses (58-63 credits)**

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra **Credits**: 3.00
- MA 26100 - Multivariate Calculus **Credits**: 4.00 or
- MA 27101 - Honors Multivariate Calculus **Credits**: 5.00

**Required CS Major Core Courses (21 credits)**

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming **Credits**: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science **Credits**: 3.00 ♦
- CS 24000 - Programming In C **Credits**: 3.00 ♦
- CS 25000 - Computer Architecture **Credits**: 4.00
- CS 25100 - Data Structures And Algorithms **Credits**: 3.00
- CS 25200 - Systems Programming **Credits**: 4.00

**Security Concentration (18 credits)**

Must have a "C" or better in all courses.
Required Courses

Must have a "C" or better in all courses.

- CS 35400 - Operating Systems Credits: 3.00
- CS 35500 - Introduction To Cryptography Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose three.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - SWS Software Security
- CS 30700 - Software Engineering I Credits: 3.00 or
- CS 40800 - Software Testing Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00 or
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00 or
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00 or
- CS 45600 - Programming Languages Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- CS 48900 - Embedded Systems Credits: 3.00 or
- CS 49000 - Topics In Computer Sciences For Undergraduates-DSO Distributed Systems

Concentration Notes

No course may be counted for both a required and selective course within the same track.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a "C" or better in all courses.

- CS 39700 - Honors Seminar Credits: 0.00
- CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
- MA 35301 - Linear Algebra II Credits: 3.00 or
- MA 41600 - Probability Credits: 3.00 or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
- An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
- An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00 or
- CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00

Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.
Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^- Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III
Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have C or better. or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have C or better.

Science Technology & Society\(^*\) (1-3 credits)

Choose one from the Science, Technology and Society list here (satisfies Science, Technology, and Society for core)

Statistics (3 credits)

Must have C or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)

Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.
GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- *Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement.* CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

*For a complete listing of University Core Course Selectives, visit the [Provost's Website](https://provost.purdue.edu).*

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (Recommended CS 19700 )

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 *** ♦
- CS 24000 - Programming In C Credits: 3.00 *** ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700 )
- Electives - Credit Hours: 1.00
15-17 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00 *** or
- MA 41600 - Probability Credits: 3.00 *** or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
- An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
- An approved MA course with a course number higher than STAT 51100***
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00
- Security Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200 )
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (Recommended CS 39100)
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

- Security Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
- Security Concentration course - Credit Hours: 3.00 ***
- Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Security Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Security Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

• CS 49700 - Honors Research Project Credits: 3.00
• Security Concentration course - Credit Hours: 3.00 ***
• CS 50000 level - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."
Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Computer Science Honors: Software Engineering, BS

About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

The Software Engineering track is designed to prepare students to become software engineers who:

- understand and can use the principles and techniques of software engineering essential for the design and development of large software products,
- are familiar with and can effectively use a variety of tools for software analysis, design, testing, and maintenance, and
- can effectively work in teams and communicate orally and in writing.

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:
1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Honors Major Courses (58-63 credits)**

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

Must have C or better to meet prerequisite for certain upper level CS courses

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
Required CS Major Core Courses (21 credits)

Must have C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Software Engineering Concentration (18 credits)

Required Courses

- CS 30700 - Software Engineering I Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 40700 - Software Engineering Senior Project Credits: 3.00
- CS 40800 - Software Testing Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00 or
- CS 35400 - Operating Systems Credits: 3.00

Selective

Choose one course.

- CS 34800 - Information Systems Credits: 3.00
- CS 35100 - Cloud Computing Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 48900 - Embedded Systems Credits: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00
- DSO Distributed Systems
- SWS Software Security
- CS 51000 - Software Engineering Credits: 3.00
- CS 590 - Topics In Computer Sciences Credits: 1.00 to 5.00
- SRS Software Reliability and Security

Software Engineering Senior Project
• The Software Engineering Senior Project (CS 40700) must be completed in the student's last or next-to-last semester.
• It must be a team project involving 4-6 people.
• CS 30700 is a pre-requisite for the Software Engineering Senior Project.

Concentration Notes

• All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.
• No course may be counted for both a required and selective course within the same track.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a C or better in all courses

• CS 39700 - Honors Seminar Credits: 0.00
• CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 41600 - Probability Credits: 3.00 or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
• An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
• An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00
• CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
• Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
**Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

*(satisfies Quantitative Reasoning for core)*

- MA 16100 - Plane Analytic Geometry And Calculus I *Credits: 5.00* (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I *Credits: 4.00* (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II *Credits: 5.00*
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (0-3 credits)
Choose one from the Science Technology and Society list, excluding those on the College of Science No Count list (satisfies STS for core).

Statistics (3 credits)

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)

Enrollment in freshman seminar course CS 19300 is required with CS 18000. This is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

• All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

• 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

• Enrollment in freshman seminar course CS 19300 is required with CS 18000. This is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00
- CS 24000 - Programming In C Credits: 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700 )
- Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• MA 35301 - Linear Algebra II Credits: 3.00 *** or
• MA 41600 - Probability Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100***
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00
• Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200 )
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Software Engineering Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Software Engineering Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year
• CS 49700 - Honors Research Project Credits: 3.00
• Software Engineering Concentration course - Credit Hours: 3.00 ***
• CS 50000 level - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science Honors: Software Engineering, BS (West Lafayette & Indianapolis)

About the Program

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of
four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project).

The Software Engineering track is designed to prepare students to become software engineers who:

- understand and can use the principles and techniques of software engineering essential for the design and development of large software products,
- are familiar with and can effectively use a variety of tools for software analysis, design, testing, and maintenance, and
- can effectively work in teams and communicate orally and in writing.

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Honors Major Courses (58-63 credits)

Must have C or better in all courses.

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

Must have C or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Software Engineering Concentration (18 credits)

Must have C or better in all courses.

Required Courses

- CS 30700 - Software Engineering I Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 40700 - Software Engineering Senior Project Credits: 3.00
• CS 40800 - Software Testing Credits: 3.00
• CS 35200 - Compilers: Principles And Practice Credits: 3.00 or
• CS 35400 - Operating Systems Credits: 3.00

Selectives

Choose one course.

• CS 31100 - Competitive Programming II Credits: 2.00 and
• CS 41100 - Competitive Programming III Credits: 2.00 The combination of CS 31100 and CS 41100 satisfies one selective.
• CS 34800 - Information Systems Credits: 3.00
• CS 35100 - Cloud Computing Credits: 3.00
• CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
• CS 35400 - Operating Systems Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00
• CS 42600 - Computer Security Credits: 3.00
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00
• CS 45600 - Programming Languages Credits: 3.00
• CS 47300 - Web Information Search And Management Credits: 3.00
• CS 48900 - Embedded Systems Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - Titles: DSO - Distributed Systems; SWS - Software Security
• CS 51000 - Software Engineering Credits: 3.00
• CS 59000 - Topics In Computer Sciences Credits: 1.00 to 5.00 - Title: SRS - Software Reliability and Security

Software Engineering Senior Project

• The Software Engineering Senior Project (CS 40700) must be completed in the student's last or next-to-last semester.
• It must be a team project involving 4-6 people.
• CS 30700 is a pre-requisite for the Software Engineering Senior Project.

Concentration Notes

• No course may be counted for both a required and selective course within the same concentration.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a C or better in all courses.

• CS 39700 - Honors Seminar Credits: 0.00
• CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 41600 - Probability Credits: 3.00 or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
- An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
- An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00
- CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
- Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^- Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here (ADD LINK IN ACALOG). (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III
General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core) Must have C or better.

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies Science, Technology, Society for core).

Statistics (3 credits)

Must have a C or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (2-30 credits)
Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 19700, CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 *** ♦
- CS 24000 - Programming In C Credits: 3.00 *** ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 (Recommended CS 19700)
- Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00 *** or
- MA 41600 - Probability Credits: 3.00 *** or
- MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
- An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
- An approved MA course with a course number higher than STAT 51100***
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00
- Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (Recommended CS 39100)
- Elective - Credit Hours: 3.00

16-17 Credits
Spring 3rd Year

- Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Great Issues In Science - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

- CS 39700 - Honors Seminar Credits: 0.00
- Software Engineering Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

- CS 49700 - Honors Research Project Credits: 3.00
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- CS 50000 level - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Computer Science Honors: Systems Software, BS**

**About the Program**

Students in the Computer Science Honors major, in addition to fulfilling all the requirements for a BS in Computer Science, will complete additional coursework and a research project. Honors students must maintain an overall GPA of 3.25 plus at least a 3.6 in Computer Science and required CSHO courses. The program requirements include additional math coursework, three out of four selected CS and ECE courses, a research seminar and project, and a graduate level course. It is especially suitable for students planning on graduate level coursework, though it also offers advantages to students seeking employment.

Students are invited to declare the major if they meet the qualifications after their first semester or after completion of the six core courses. Students who have been admitted to the Honors College may also join the major. Students may also request to declare the major if they meet qualifications no later than their seventh semester (student must have at least 2 academic semesters remaining to accommodate both the research seminar and the research project). The Systems Software track is designed to prepare students to become programmers who can build...

- low-level software that uses or runs inside an operating system,
- system tools for other users (e.g., compilers and assemblers),
- programs that communicate over a computer network or the Internet (e.g., web servers).

Computer Science Website

Computer Science Major Change (CODO) Requirements (Students must first CODO into Computer Science before Honors.)

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:
1. Major
2. Science Core Curriculum
3. Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Honors Major Courses (58-63 credits)**

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding for College of Science)
• CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
• CS 24000 - Programming In C Credits: 3.00 ♦
• CS 25000 - Computer Architecture Credits: 4.00
• CS 25100 - Data Structures And Algorithms Credits: 3.00
• CS 25200 - Systems Programming Credits: 4.00

Systems Software Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

• CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 35400 - Operating Systems Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose three.

• CS 30700 - Software Engineering I Credits: 3.00
• CS 31100 - Competitive Programming II Credits: 2.00 or
• CS 41100 - Competitive Programming III Credits: 2.00 The combination of CS 31100 and CS 41100 satisfies one selective.
• CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
• CS 35100 - Cloud Computing Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 42600 - Computer Security Credits: 3.00
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00
• CS 45600 - Programming Languages Credits: 3.00
• CS 48900 - Embedded Systems Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 Title: Introduction to VR/AR
  • DSO Distributed Systems
  • Senior Project

Concentration Notes
• The track has three electives, chosen from the list provided. In addition to elective courses listed, other courses, including project and independent study courses, will be approved as electives, provided the course involves systems programming (as opposed to web page scripting, or other high-level application programming). Faculty strongly recommend that students include a senior project as one of the electives.
• The Software Engineering Senior Project cannot be used as the Systems research project unless track chair approval from both track chairs is obtained.
• No course may be counted for both a required and selective course within the same track.

Required CS Honors - (12-13 credits)

Need CS GPA of 3.60 or better & cumulative GPA of 3.25 and must have a "C" or better in all courses

• CS 39700 - Honors Seminar Credits: 0.00
• CS 49700 - Honors Research Project Credits: 3.00 (may use for Track Elective - see Track chairperson for approval)
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 41600 - Probability Credits: 3.00 or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 or
• An approved MA course with course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 or
• An approved STAT course with course number higher than STAT 51100 - Statistical Methods Credits: 3.00
• CS 50000 level course (may use for Track Elective - see Track chairperson for approval) - Credit Hours: 3.00
• Three out of the four following courses: CS 35400, CS 35200, CS 38100, ECE 27000. CS 35400, CS 35200, and CS 38100 may be used to meet track requirements if the courses are required or electives for the student's track.

Other Departmental/Program Course Requirements (32-55 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better) or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better)

Science Technology and Society^* (1-3 credits)
Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Must have C or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

*Met with required major coursework.*

Electives (2-30 credits)

Enrollment in freshman seminar course CS 19300- Tools is strongly encouraged to be taken with CS 18000. This is not a degree requirement. CS 19700 - Freshman Honors Seminar, CS 29100 - Sophomore Development Seminar, and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of a "C" or better.

GPA Requirements

- 3.6 CS GPA and 3.25 cumulative GPA is required for graduation with the CS Honors degree.

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.
College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 *** ♦
• CS 24000 - Programming In C Credits: 3.00 *** ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 (Recommended CS 19700 )
• Electives - Credit Hours: 1.00

15-17 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00 (Recommended CS 29100)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• MA 35301 - Linear Algebra II Credits: 3.00 *** or
• MA 41600 - Probability Credits: 3.00 *** or
• MA 51800 - Advanced Discrete Mathematics Credits: 3.00 *** or
• An approved MA course with a course number higher than MA 35100 - Elementary Linear Algebra Credits: 3.00 *** or
• An approved MA course with a course number higher than STAT 51100
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00
• Systems Software Concentration course - Credit Hours: 3.00 *** (Suggested CS 35200)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (Recommended CS 39100)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Systems Software Concentration course - Credit Hours: 3.00 *** (Suggested CS 35400)
• Systems Software Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 39700 - Honors Seminar Credits: 0.00
• Systems Software Concentration course - Credit Hours: 3.00 *** (Suggested CS 38100)
• Systems Software Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Spring 4th Year

• CS 49700 - Honors Research Project Credits: 3.00
• Systems Software Concentration course - Credit Hours: 3.00 ***
• CS 50000 level - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits
World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Computer Science: Algorithmic Foundations, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements
Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area, like Algorithmic Foundations.

**Degree Requirements**

**120 Credits Required**

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**
Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Major Courses (46-50 credits)**

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

**Required CS Major Core Courses (21 credits)**

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

**Algorithmic Foundations Concentration (18 credits)**

Must have a "C" or better in all courses.

**Required Courses**

Must have a "C" or better in all courses.

- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00 or
- CS 35400 - Operating Systems Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00

**Selectives**

Must have a "C" or better in all courses. **Choose three.**

- CS 31100 - Competitive Programming II Credits: 2.00 and
- CS 41100 - Competitive Programming III Credits: 2.00 The combination of CS 31100 and CS 41100 satisfies one selective.
- CS 31400 - Numerical Methods Credits: 3.00
- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 35500 - Introduction To Cryptography Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 45800 - Introduction To Robotics Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00
- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 35301 - Linear Algebra II Credits: 3.00 or
- MA 36200 - Topics In Vector Calculus Credits: 3.00 or
- MA 38500 - Introduction To Logic Credits: 3.00 or
- MA 36600 - Ordinary Differential Equations Credits: 4.00 or
- MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00 or
- MA 45300 - Elements Of Algebra I Credits: 3.00 or
- One three-credit computer science course at the 300, 400, 500 level* or an independent study course approved by the track chair.

Concentration Notes

- The use of any Variable Title course must be approved by the faculty.
- Use of 300, 400, and 500 level CS courses outside of track or an independent study course to count as a track elective requires track chair approval.
- Non-CS courses and graduate level courses may have additional prerequisites that must be met in order to be eligible to take the course.
- No more than one Math course may be counted toward the Electives.
- No course can be counted both for a required and selective course within the same track.

Other Departmental/Program Course Requirements (32-54 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)
Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here (ADD LINK IN ACALOG). (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science or Science Technology and Society for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better) or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better)

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies Science, Technology, Society for core)

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (16-42 credits)

Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.
College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
• CS 24000 - Programming In C Credits: 3.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00-3.00(CS 29100 recommended)

15-18 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

• Algorithmic Foundations Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)
Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Computational Science And Engineering, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. This concentration is intended to introduce computer science basics in Computational Science and Engineering (CS&E). Students not intending to pursue an advanced degree are advised to choose Option 1 for electives and to take courses in some area of pure or applied science with the objective of learning how to develop software useful for the chosen area. Students intending to pursue an advanced degree are advised to choose Option 2 for electives and also to take the following courses: Physics lab science courses; MA 35100 rather than MA 26500, MA 36200 or MA 44200; MA 36600 rather than MA 26600, MA 34100, or MA 44000.

Degree Requirements

120 Credits Required
Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have a "C" or better in all courses.

Required CS Major Math Courses (7-8 credits)
Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus **Credits: 4.00** or
- MA 27101 - Honors Multivariate Calculus **Credits: 5.00**
- MA 26500 - Linear Algebra **Credits: 3.00** or
- MA 35100 - Elementary Linear Algebra **Credits: 3.00**

### Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming **Credits: 4.00** ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science **Credits: 3.00** ♦
- CS 24000 - Programming In C **Credits: 3.00** ♦
- CS 25000 - Computer Architecture **Credits: 4.00**
- CS 25100 - Data Structures And Algorithms **Credits: 3.00**
- CS 25200 - Systems Programming **Credits: 4.00**

### Computational Science and Engineering Concentration (21 credits)

Must have a "C" or better in all courses.

#### Required Courses

Must have a "C" or better in all courses.

- CS 31400 - Numerical Methods **Credits: 3.00**
- CS 38100 - Introduction To The Analysis Of Algorithms **Credits: 3.00**
- MA 26600 - Ordinary Differential Equations **Credits: 3.00** or
- MA 36600 - Ordinary Differential Equations **Credits: 4.00**

#### Applications

Must have a "C" or better in all courses. **Choose one.**

- CS 37300 - Data Mining And Machine Learning **Credits: 3.00**
- CS 47300 - Web Information Search And Management **Credits: 3.00**
- CS 47800 - Introduction To Bioinformatics **Credits: 3.00**
- ECE 30100 - Signals And Systems **Credits: 3.00**
- IE 33600 - Operations Research - Stochastic Models **Credits: 3.00**

#### Systems

Must have a "C" or better in all courses. **Choose one.**

- CS 35200 - Compilers: Principles And Practice **Credits: 3.00**
- CS 35300 - Principles Of Concurrency And Parallelism **Credits: 3.00**
- CS 35400 - Operating Systems **Credits: 3.00**
Selectives

Must have a "C" or better in all courses. **Choose 2 courses.**

- CS 30700 - Software Engineering I **Credits:** 3.00
- CS 42200 - Computer Networks **Credits:** 3.00
- CS 45600 - Programming Languages **Credits:** 3.00
- CS 45800 - Introduction To Robotics **Credits:** 3.00
- CS 47100 - Introduction To Artificial Intelligence **Credits:** 3.00
- CS 48300 - Introduction To The Theory Of Computation **Credits:** 3.00
- CS 51500 - Numerical Linear Algebra **Credits:** 3.00
- CS 52000 - Computational Methods In Optimization **Credits:** 3.00
- CS 52500 - Parallel Computing **Credits:** 3.00
- IE 33500 - Operations Research - Optimization **Credits:** 3.00
- MA 34100 - Foundations Of Analysis **Credits:** 3.00
- MA 44000 - Honors Real Analysis I **Credits:** 3.00

Other Departmental/Program Course Requirements (32-54 credits)

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

**Written Communication (3-4 credits)**

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

**Technical Writing And Presentation* (0 or 3 credits)**

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

**Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*
Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a C or better or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a C or better

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration
Met with required major coursework.

Electives (16-42 credits)

CS 19300 - Tools
Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their prerequisites, regardless of department, must be completed with a grade of "C" or better.

GPA Requirements

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

Course Requirements & Notes

- At least four (4) of the seven (7) courses for Computation Science and Engineering concentration must be CS courses.
- Any course beyond the one required class from the lists of Applications/Systems courses counts as an elective.
- Non-CS courses and graduate level courses may have additional prerequisites that must be met in order to be eligible to take the course.
- No course can be counted both for a required and selective course within the same track.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements
University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits
Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
- CS 24000 - Programming In C Credits: 3.00 ♦ ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 29100 recommended)

15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦
- Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
- Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 39100 recommended)
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year
• Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
• Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
• Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***

• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

• Computational Science and Engineering Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."
Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Computer Graphics and Visualization, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. The Computer Graphics and Visualization concentration is designed to prepare students for work and/or for graduate school in computer graphics, visualization, and related areas. Computer graphics refers to modeling (including 3D acquisition) and rendering 3D objects and scenes. Visualization refers to using imagery to convey digital information and facilitate its interpretation and analysis. Jobs and activities for students graduating from this track may include:

Graphics-related Industry jobs (e.g., Intel, NVIDIA, Microsoft, Adobe, IBM, Google) - working on graphics software, hardware, and applications.

CAD and Architectural Applications - developing CAD/Engineering/Architecture related applications.

Movie Industry (e.g., Pixar, Dreamworks, Disney, Sony) - working on creating movies and related tools.

Gaming Industry (e.g., Electronic Arts, Midway Games, Disney, Sony) - working on game programming and related tools.

Laboratories - working in one of several scientific visualization laboratories (though often a graduate degree is preferred).

Graduate school - continuing studies towards a MS or PhD which opens up other job opportunities including research labs and academic positions.

Degree Requirements
120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have a "C" or better in all courses.
Required CS Major Math Courses (7-8 credits)

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Computer Graphics and Visualization Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

- CS 31400 - Numerical Methods Credits: 3.00
- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
- CS 43400 - Advanced Computer Graphics Credits: 3.00 or
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose 3 courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
- CS 43400 - Advanced Computer Graphics Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 45800 - Introduction To Robotics Credits: 3.00
- CS 43900 - Introduction To Data Visualization Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates **Credits:** 1.00 to 5.00 Title: Introduction to VR/AR - Credit Hours: 3.00

**Project Option**

Electives could include 1 semester of CS 49000 project course with CGVLAB.

This option is very useful to undergraduate students involved in research, and such is beneficial to both job-seeking and graduate school-seeking students.

**Track Notes**

• No course can be counted both for a required and selective course within the same track.
• Electives could include one semester of CS 49000 project with CGVLAB with Track Chair approval.

**Other Departmental/Program Course Requirements (32-54 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

**Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education** (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science** (3 credits)

Choose one from this list.

**Laboratory Science** (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics** (8-10 credits)

*(satisfies Quantitative Reasoning for core)*

- MA 16100 - Plane Analytic Geometry And Calculus I *Credits: 5.00* (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I *Credits: 4.00* (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II *Credits: 5.00* (must have C or better) or
- MA 16600 - Analytic Geometry And Calculus II *Credits: 4.00* (must have C or better)

**Science Technology and Society** (1-3 credits)

Choose one from the Science Technology and Society list here *(satisfies Science, Technology, Society for core)*

**Statistics** (3 credits)

Must have C or better in all courses.

- STAT 35000 - Introduction To Statistics *Credits: 3.00* ♦ or
- STAT 51100 - Statistical Methods *Credits: 3.00* ♦

**Team-Building and Collaboration**

*Met with required major coursework.*
Electives (16-42 credits)

*CS 19300 - Tools* Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
- CS 24000 - Programming In C Credits: 3.00 ♦ ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 - 3.00
14-18 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 29100 recommended)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits
Fall 4th Year

- Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

- Computer Graphics and Visualization Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.
Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Computer Science: Database and Information Systems, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

**Computer Science Website**

**Computer Science Major Change (CODO) Requirements**

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. Database and Information Systems is designed to prepare students to become computer scientists who understand and can apply the principles and techniques of database design, algorithms for information retrieval, their strengths and limitations, and tools for the design of databases and information systems.

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.
Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Major Courses (46-50 credits)**

Must have "C" or better in all courses.

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

Must have "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

**Required CS Major Core Courses (21 credits)**

Must have "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
• CS 25200 - Systems Programming Credits: 4.00

Database and Information Systems Concentration (21 credits)

Must have "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

• CS 34800 - Information Systems Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
• CS 47300 - Web Information Search And Management Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose one course from each of the following three categories.

Category I - Computing Systems

• CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
• CS 35400 - Operating Systems Credits: 3.00

Category II - Information Assurance

• CS 35500 - Introduction To Cryptography Credits: 3.00
• CS 42600 - Computer Security Credits: 3.00

Category III - Related Studies

• CS 37300 - Data Mining And Machine Learning Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00
• CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 47300 - Web Information Search And Management Credits: 3.00
• CS 47800 - Introduction To Bioinformatics Credits: 3.00
• CS 48300 - Introduction To The Theory Of Computation Credits: 3.00

Senior Project Option:
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - (Senior Project)
• CS 49700 - Honors Research Project Credits: 3.00

or
• EPCS 41100 - Senior Design Participation In EPICS Credits: 1.00 and
• EPCS 41200 - Senior Design Participation In EPICS Credits: 2.00 - (Senior Project)

Other Departmental/Program Course Requirements (32-54 credits)
COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.
Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a C or better or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a C or better.

Science Technology and Society\(^*\) (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (16-42 credits)

CS 19300 - Tools Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their prerequisites, regardless of department, must be completed with a grade of "C" or better.

GPA Requirements

- 2.0 Major and Graduation GPA required for Bachelor of Science degree.
Course Requirements & Notes

- Senior Project (CS 49000/CS 49700) must be taken for at least three credits, be supervised by CS faculty & approved by DBIS track chair.
- No course can be counted both for a required and selective course within the same track.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.
Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

**Sample 4-Year Plan**

**Fall 1st Year**

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

**Spring 1st Year**

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
- CS 24000 - Programming In C Credits: 3.00 ♦ ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

**Fall 2nd Year**

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 29100 recommended)
15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00
- MA 26500 - Linear Algebra Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00
- Database and Information Systems Concentration course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 39100 recommended)
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

- Database and Information Systems Concentration course - Credit Hours: 3.00
- Great Issues In Science Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

- Database and Information Systems Concentration course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00
16-18 Credits

Spring 4th Year

- Database and Information Systems Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Machine Intelligence, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. Machine Intelligence is designed to prepare students to work in fields related to management and analysis of data, including areas such as machine learning, information retrieval, and data mining. The track is designed to prepare students to understand, and effectively apply in practice, the principles and techniques of data and knowledge representation, search, as well as learning and reasoning with data.

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have C or better in all courses.

Required CS Major Math Courses (7-8 credits)

Must have C or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

Required CS Major Core Courses (21 credits)

Must have C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Machine Intelligence Concentration (18 credits)

Must have C or better in all courses.

Required Courses for Machine Intell (12 credits)
Selectives (6 credits)

Choose two.

- CS 31400 - Numerical Methods Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00
- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 45800 - Introduction To Robotics Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
- CS 47300 - Web Information Search And Management Credits: 3.00
- CS 48200 - Introduction To The Theory Of Computation Credits: 3.00
- CS 57700 - Natural Language Processing Credits: 3.00
- CS 57800 - Statistical Machine Learning Credits: 3.00
- CS 44000 - Large Scale Data Analytics Credits: 3.00 or
- CS 43900 - Introduction To Data Visualization Credits: 3.00 or
- CS 47500 - Human-Computer Interaction Credits: 3.00

Other Departmental/Program Course Requirements (32-54 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here (ADD LINK IN ACALOG). (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core) Must have C or better.

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science, Technology, and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies Science, Technology, Society for core)
Statistics (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (16-42 credits)

CS 19300 - Tools Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

Course Requirements & Notes

- Non-CS courses and graduate level courses may have additional prerequisites that must be met in order to be eligible to take the course.
- No course can be counted both for a required and selective course within the same track.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the [Civics Literacy Proficiency Website](#).

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

**Sample 4-Year Plan**

**Fall 1st Year**

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 ***
• CS 24000 - Programming In C Credits: 3.00 ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 29100 recommended)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Machine Intelligence Concentration course- Credit Hours: 3.00 ***
• Machine Intelligence Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
16-17 Credits

Spring 3rd Year

- Machine Intelligence Concentration course - Credit Hours: 3.00
- Machine Intelligence Concentration course - Credit Hours: 3.00
- Great Issues In Science Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

- Machine Intelligence Concentration course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

- Machine Intelligence Concentration course - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Programming Languages, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. This track is designed to prepare students to work in fields related to program understanding, manipulation and transformation. This includes run-time system engineering as well as domain specific techniques (e.g., real-time computing or web programming). They will acquire tools and techniques needed to specify and implement language-based solutions.

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:
Major
Science Core Curriculum
Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Computer Science Major Courses (46-50 credits)**

Must have a "C" or better in all courses.

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

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus **Credits: 4.00**
- MA 27101 - Honors Multivariate Calculus **Credits: 5.00**
- MA 26500 - Linear Algebra **Credits: 3.00**
- MA 35100 - Elementary Linear Algebra **Credits: 3.00**
Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Programming Language Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose 3 courses.

- CS 30700 - Software Engineering I Credits: 3.00 or
- CS 40800 - Software Testing Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00 or
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
- CS 56000 - Reasoning About Programs Credits: 3.00
- MA 38500 - Introduction To Logic Credits: 3.00 or
- MA 45300 - Elements Of Algebra I Credits: 3.00

Other Departmental/Program Course Requirements (32-54 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation
First-Year Composition (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II
Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 Must have a C or better or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 Must have a C or better.

Science Technology and Society^* (1-3 credits)

Choose one from the Science, Technology and Society list here (satisfies Science, Technology, and Society for core)

Statistics (3 credits)

Must have a "C" or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (16-42 credits)

CS 19300 - Tools Enrollment in first year seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 - Tools is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

Course Requirements & Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student’s major(s), minor(s) or science core curriculum.

• Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.

• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).

• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.

• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.

• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the [Civics Literacy Proficiency Website](#).

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**
• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)
15-17 Credits

Spring 1st Year
• CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
• CS 24000 - Programming In C Credits: 3.00 ♦ ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 - 3.00
14-18 Credits

Fall 2nd Year
• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 29100 recommended)
15-17 Credits

Spring 2nd Year
• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ● or
• STAT 51100 - Statistical Methods Credits: 3.00 ●
• Programming Language Concentration course - Credit Hours: 3.00 ***
• Programming Language Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Programming Language Concentration course - Credit Hours: 3.00 ***
• Programming Language Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• Programming Language Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

• Programming Language Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits
Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Security, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements
Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. The Security track is designed to prepare students to become computer scientists who:

- understand the importance of and are capable of designing and developing secure software,
- are familiar with the societal impact of insecure software and related infrastructure, and
- are familiar with and can use techniques for testing and assessing systems for secure operation.

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have a "C" or better in all courses.

Required CS Major Math Courses (7-8 credits)

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00
- CS 24000 - Programming In C Credits: 3.00
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Security Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

- CS 35400 - Operating Systems Credits: 3.00
- CS 35500 - Introduction To Cryptography Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose 3 courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - SWS Software Security
• CS 30700 - Software Engineering I Credits: 3.00 or
• CS 40800 - Software Testing Credits: 3.00
• CS 34800 - Information Systems Credits: 3.00 or
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00 or
• CS 47300 - Web Information Search And Management Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00 or
• CS 45600 - Programming Languages Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
• CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 48900 - Embedded Systems Credits: 3.00 or
• CS 49000 - Topics In Computer Science For Undergraduates - DSO Distributed Systems

Other Departmental/Program Course Requirements (32-54 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

*Met with required major coursework.*

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

• Laboratory Science Option I
• Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better) or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better)

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here, (satisfies STS for core).

Statistics (3 credits)

Must have a C or better in all courses.

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.
Electives (16-42 credits)

*CS 19300 - Tools* Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 18000 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

Course Requirements & Notes

- No course can be counted both for a required and selective course within the same track.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
- CS 24000 - Programming In C Credits: 3.00 ♦ ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 29100 recommended)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Security Concentration course - Credit Hours: 3.00 ***
• Security Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Security Concentration course - Credit Hours: 3.00 ***
• Security Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• Security Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

• Security Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Computer Science: Software Engineering, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, and problem-solving skills and acquire the necessary technical skills for positions in computing throughout society.

**Computer Science Website**

**Computer Science Major Change (CODO) Requirements**

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area.

The Software Engineering track is designed to prepare students to become software engineers who:

- understand and can use the principles and techniques of software engineering essential for the design and development of large software products,
- are familiar with and can effectively use a variety of tools for software analysis, design, testing, and maintenance, and
- can effectively work in teams and communicate orally and in writing.

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:
Purdue Coursework
AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.
College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are
strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of
each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests
or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second
majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a
student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning
opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested
students should contact their academic advisor for more information on this option and incorporating experiential learning into
their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have a "C" or better in all courses.

Required CS Major Math Courses (7-8 credits)

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
• CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
• CS 24000 - Programming In C Credits: 3.00 ♦
• CS 25000 - Computer Architecture Credits: 4.00
• CS 25100 - Data Structures And Algorithms Credits: 3.00
• CS 25200 - Systems Programming Credits: 4.00

Software Engineering Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses

Must have a "C" or better in all courses.

• CS 30700 - Software Engineering I Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 40700 - Software Engineering Senior Project Credits: 3.00
• CS 40800 - Software Testing Credits: 3.00
• CS 35200 - Compilers: Principles And Practice Credits: 3.00 or
• CS 35400 - Operating Systems Credits: 3.00

Selectives

Must have a "C" or better in all courses. Choose one.

• CS 31100 - Competitive Programming II Credits: 2.00 and
• CS 41100 - Competitive Programming III Credits: 2.00 The combination of CS 31100 and CS 41100 satisfies one selective.
• CS 34800 - Information Systems Credits: 3.00
• CS 35100 - Cloud Computing Credits: 3.00
• CS 35200 - Compilers: Principles And Practice Credits: 3.00
• CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
• CS 35400 - Operating Systems Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00
• CS 42200 - Computer Networks Credits: 3.00
• CS 42600 - Computer Security Credits: 3.00
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00
• CS 45600 - Programming Languages Credits: 3.00
• CS 47300 - Web Information Search And Management Credits: 3.00
• CS 48900 - Embedded Systems Credits: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - Titles: DSO - Distributed Systems; SWS - Software Security
• CS 51000 - Software Engineering Credits: 3.00
• CS 59000 - Topics In Computer Sciences Credits: 1.00 to 5.00 - Title: SRS - Software Reliability and Security

Software Engineering Senior Project

• The Software Engineering Senior Project (CS 40700) must be completed in the student's last or next-to-last semester.
• It must be a team project involving 4-6 people.
• CS 30700 is a pre-requisite for the Software Engineering Senior Project.

Concentration Notes

• No course can be counted both for a required and selective course within the same concentration.

Other Departmental/Program Course Requirements (32-54 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

*(satisfies Quantitative Reasoning for core) Must have C or better.*

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

**Science, Technology, and Society**\(^*\) (1-3 credits)

Choose one from the Science Technology and Society list here *(satisfies Science, Technology, Society for core)*

**Statistics (3 credits)**

Must have a C or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 \(♦\) or
- STAT 51100 - Statistical Methods Credits: 3.00 \(♦\)

**Team-Building and Collaboration**

*Met with required major coursework.*

**Electives (16-42 credits)**

*CS 19300 - Tools*Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 18000. *CS 19300 is not a degree requirement.* CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

**Grade Requirements**
• All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.
Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ ***
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
- CS 24000 - Programming In C Credits: 3.00 ♦ ***
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

- CS 25000 - Computer Architecture Credits: 4.00 ***
- CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 29100 recommended)
15-17 Credits

Spring 2nd Year

- CS 25200 - Systems Programming Credits: 4.00 ***
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (CS 39100 recommended)
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Great Issues In Science Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

16-18 Credits
Spring 4th Year

- Software Engineering Concentration course - Credit Hours: 3.00 ***
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Computer Science: Systems Software, 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, web programming, competitive programming, cryptography and security, networks, software engineering, distributed systems, information systems, artificial intelligence, and bioinformatics.

The flexible curriculum offers students the 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. Students learn communication skills, teamwork, problem-solving skills, and acquire the necessary technical skills for positions in computing throughout society.

Computer Science Website

Computer Science Major Change (CODO) Requirements

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students then take coursework in a concentration, which allows them to deepen their understanding in a specific area. The Systems Software track is designed to prepare students to become programmers who can build...

- low-level software that uses or runs inside an operating system,
- system tools for other users (e.g., compilers and assemblers),
- programs that communicate over a computer network or the Internet (e.g., web servers).

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Computer Science Major Courses (46-50 credits)

Must have a "C" or better in all courses.

Required CS Major Math Courses (7-8 credits)

Must have a "C" or better in all courses.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- MA 26500 - Linear Algebra Credits: 3.00 or
- MA 35100 - Elementary Linear Algebra Credits: 3.00

Required CS Major Core Courses (21 credits)

Must have a "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦
- CS 24000 - Programming In C Credits: 3.00 ♦
- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00

Systems Software Concentration (18 credits)

Must have a "C" or better in all courses.

Required Courses (9 credits)

Must have a "C" or better in all courses.

- CS 35200 - Compilers: Principles And Practice Credits: 3.00
- CS 35400 - Operating Systems Credits: 3.00
- CS 42200 - Computer Networks Credits: 3.00
Selectives (9 credits)

Must have a "C" or better in all courses. **Choose 3 courses.**

- CS 30700 - Software Engineering I Credits: 3.00
- CS 31100 - Competitive Programming II Credits: 2.00 and
- CS 41100 - Competitive Programming III Credits: 2.00 *The combination of CS 31100 and CS 41100 satisfies one selective.*
- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 35100 - Cloud Computing Credits: 3.00
- CS 35300 - Principles Of Concurrency And Parallelism Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 42600 - Computer Security Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 45600 - Programming Languages Credits: 3.00
- CS 48900 - Embedded Systems Credits: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 Title: Intorduction to VR/AR - Credit Hours: 3.00
- DSO Distributed Systems
- Senior Project

Notes

- The track has three electives, chosen from the list provided. In addition to elective courses listed, other courses, including project and independent study courses, will be approved as electives, provided the course involves systems programming (as opposed to web page scripting, or other high-level appliaction programming). Faculty **strongly recommend** that students include a senior project as one of the electives.
- The Software Engineering Senior Project cannot be used as the Systems research project unless track chair approval from both track chairs is obtained.

Other Departmental/Program Course Requirements (32-54 credits)

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better) or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better)
Science Technology and Society^* (1-3 credits)

Choose one from the Science, Technology and Society list here (satisfies Science, Technology, and Society for core)

Statistics (3 credits)

Must have C or better in all courses.

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 51100 - Statistical Methods Credits: 3.00 ♦

Team-Building and Collaboration

Met with required major coursework.

Electives (16-42 credits)

CS 19300 - Tools Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 are optional but recommended.

Grade Requirements

- All major required courses, all track requirements and track selectives, and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

Course Requirements & Notes

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00-4.00 (English Composition suggested.)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 (CS 19300 suggested.)

15-17 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00 ♦ ***
• CS 24000 - Programming In C Credits: 3.00 ♦ ***
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 1.00 - 3.00

14-18 Credits

Fall 2nd Year

• CS 25000 - Computer Architecture Credits: 4.00 ***
• CS 25100 - Data Structures And Algorithms Credits: 3.00 ***
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 29100 recommended)

15-17 Credits

Spring 2nd Year

• CS 25200 - Systems Programming Credits: 4.00 ***
• MA 26500 - Linear Algebra Credits: 3.00 or
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00 (COM 21700 suggested.)
• Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 51100 - Statistical Methods Credits: 3.00 ♦
• Systems Software Concentration course - Credit Hours: 3.00 ***
• Systems Software Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (CS 39100 recommended)
• Elective - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

• Systems Software Concentration course - Credit Hours: 3.00 ***
• Systems Software Concentration course - Credit Hours: 3.00 ***
• Great Issues In Science Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• Systems Software Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-18 Credits

Spring 4th Year

• Systems Software Concentration course - Credit Hours: 3.00 ***
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.
In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Data Science, BS (CS)

About the Program

Majoring in data science at Purdue will place you at the forefront of an emerging field and prepare you for an exciting career at the intersection of computer science and statistics.

Created jointly by Purdue's Department of Computer Science and Department of Statistics, the data science major will open pathways to careers in virtually every area of society, from healthcare, security and sustainability to education, business and economics.

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements
All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

### Degree Requirements

**120 Credits Required**

**Data Science Major Courses (47-51 credits)**

Must have "C" or better in all courses.

**Required Data Science Courses (36-37 credits)**

Must have "C" or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00 ✦ *(satisfies Computing, and Team-Building and Collaboration, for College of Science core)*
- CS 18200 - Foundations Of Computer Science **Credits:** 3.00
- CS 25300 - Data Structures And Algorithms For DS/AI **Credits:** 3.00
- CS 37300 - Data Mining And Machine Learning **Credits:** 3.00 *(must be completed with a grade of C or better prior to the start of the Capstone Experience)*
- CS 38003 - Python Programming **Credits:** 1.00
- CS 44000 - Large Scale Data Analytics **Credits:** 3.00
- MA 35100 - Elementary Linear Algebra **Credits:** 3.00
- STAT 35500 - Statistics For Data Science **Credits:** 3.00 *(satisfies Statistics for College of Science core)*
- STAT 41600 - Probability **Credits:** 3.00
- STAT 41700 - Statistical Theory **Credits:** 3.00
- CS 24200 - Introduction To Data Science **Credits:** 3.00 or
- STAT 24200 - Introduction To Data Science **Credits:** 3.00
- MA 26100 - Multivariate Calculus **Credits:** 4.00 or
- MA 27101 - Honors Multivariate Calculus **Credits:** 5.00
CS Selectives (6 credits)

Must have "C" or better in all courses. **Choose two.**

- CS 31100 - Competitive Programming II **Credits:** 2.00
- CS 41100 - Competitive Programming III **Credits:** 2.00
- CS 31400 - Numerical Methods **Credits:** 3.00
- CS 35500 - Introduction To Cryptography **Credits:** 3.00
- CS 43900 - Introduction To Data Visualization **Credits:** 3.00
- CS 45800 - Introduction To Robotics **Credits:** 3.00
- CS 47100 - Introduction To Artificial Intelligence **Credits:** 3.00
- CS 47300 - Web Information Search And Management **Credits:** 3.00
- CS 47500 - Human-Computer Interaction **Credits:** 3.00
- CS 30700 - Software Engineering I **Credits:** 3.00 or
- CS 40800 - Software Testing **Credits:** 3.00
- CS 34800 - Information Systems **Credits:** 3.00 or
- CS 44800 - Introduction To Relational Database Systems **Credits:** 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms **Credits:** 3.00 or
- CS 48300 - Introduction To The Theory Of Computation **Credits:** 3.00

Ethics Selective (3 credits)

Must have "C" or better in all courses. **Choose one.**

- ILS 23000 - Data Science And Society: Ethical Legal Social Issues **Credits:** 3.00 *(satisfies 3.0 credits of GE for College of Science core)*
- PHIL 20700 - Ethics For Technology, Engineering, And Design **Credits:** 3.00 *(satisfies Science, Technology & Society for core and 3.0 credits of GE for College of Science core)*
- PHIL 20800 - Ethics Of Data Science **Credits:** 3.00 *(must be 3.00 Credit Hour option; satisfies Multidisciplinary Experience and 3.0 credits of GE for College of Science core)*

Statistics Selective (3 credits)

Must have "C" or better in all courses. **Choose one.**

- MA 43200 - Elementary Stochastic Processes **Credits:** 3.00
- STAT 42000 - Introduction To Time Series **Credits:** 3.00
- STAT 50600 - Statistical Programming And Data Management **Credits:** 3.00
- STAT 51200 - Applied Regression Analysis **Credits:** 3.00
- STAT 51300 - Statistical Quality Control **Credits:** 3.00
- STAT 51400 - Design Of Experiments **Credits:** 3.00
- STAT 52200 - Sampling And Survey Techniques **Credits:** 3.00
- STAT 52500 - Intermediate Statistical Methodology **Credits:** 3.00

Capstone Experience (3 credits)

**Choose one option below.**

- **STAT 49000 and Data Mine projects/courses do not fulfill the Capstone requirement.**
- CS 37300 must be completed with a grade of C or better prior to the start of the Capstone Experience.
Credit Course Options

- CS 49000 - Topics In Computer Science For Undergraduates (Individual Study) - a preapproved unpaid research opportunity in Data Science fulfills the capstone.
- CS 44100 - Data Science Capstone Credits: 3.00

Zero Credit Option

Students choosing a Zero-Credit Capstone Experience Option must complete an additional selective from either the CS Selectives or the Statistics Selectives lists.

- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 -- (Individual Study) - a preapproved paid research opportunity in Data Science fulfills the capstone.

Other Departmental/Program Course Requirements (29-52 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I (Met with required major coursework)
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core) Must have C or better.

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science, Technology, & Society^* (3 credits)

Choose one from the Science, Technology, and Society list. (satisfies STS for core)

Statistics

Met with required major coursework.

Team-Building and Collaboration

Met with required major coursework.

Electives (17-44 credits)
Enrollment in freshman seminar course - CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement. CS 29100 - Sophomore Development Seminar and CS 39100 are optional but recommended.

Grade Requirements

- For this degree, all major required courses, all major electives (selectives), and their pre-requisites, regardless of department, must be completed with a grade of C or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

Computer Science Transfer Credit Policy

- Equivalent 10000 and 20000-level Computer Science (CS) transfer credit courses (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. CS program.
- CS transfer credit at the 30000-40000-level may not be used to meet degree requirements. As exception to this policy is the application of pre-approved Study Abroad coursework.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hour: 1.00 (CS 19300 strongly recommended)
- Elective - Credit Hour: 1.00
- Electives - Credit Hours: 3.00

16-18 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 *
- CS 38003 - Python Programming Credits: 1.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First Year Composition Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00

15-18 Credits

Fall 2nd Year

- STAT 35500 - Statistics For Data Science Credits: 3.00
- CS 24200 - Introduction To Data Science Credits: 3.00 or
- STAT 24200 - Introduction To Data Science Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 - 3.00

14-18 Credits

Spring 2nd Year

- CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- STAT 41600 - Probability Credits: 3.00
- Ethics Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 - 2.00

16-18 Credits

Fall 3rd Year

- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

- CS Selective - Credit Hours 3.00
- Statistics Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• CS 44000 - Large Scale Data Analytics Credits: 3.00
• CS Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00 - 3.00

16-17 Credits

Spring 4th Year

• Capstone Experience/Course - Credit Hours: 0.00 - 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

13-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."
Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Minor

Computer Science Minor

Requirements for the Minor (16-18 credits)

- Students must complete five CS courses from the approved list of minor courses.
- Students must earn a minimum grade of 'C' in all CS courses used towards the minor (a 'C-' in not accepted).
- Students must take CS courses in off-peak terms. See the Course Access & Request policy for more information for when courses are off-peak and available to non-majors.

Required Courses (10 credits)

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *
- CS 18200 - Foundations Of Computer Science Credits: 3.00 **
- CS 24000 - Programming In C Credits: 3.00

Elective Courses - Choose Two (6-8 credits)

- CS 25000 - Computer Architecture Credits: 4.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 25200 - Systems Programming Credits: 4.00
- CS 30700 - Software Engineering I Credits: 3.00
- CS 31400 - Numerical Methods Credits: 3.00
- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 34800 - Information Systems Credits: 3.00
- CS 35500 - Introduction To Cryptography Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 40800 - Software Testing Credits: 3.00
- CS 44800 - Introduction To Relational Database Systems Credits: 3.00
- CS 47100 - Introduction To Artificial Intelligence Credits: 3.00

Notes

- Enrollment in all CS courses is subject to space availability and CS majors are given priority in registering for all CS courses. The CS department cannot guarantee students seeking a CS minor access to courses.
• All Course prerequisites must be met to enroll in any Computer Science course. No overrides for prerequisites will be approved.
• All courses used for the minor must be taken at Purdue University West Lafayette campus.
• CS Minors are limited to five (5) CS courses.
• Students are responsible for understanding our Course Access & Request policy, knowing registration timelines, and for requesting space through the correct process.
• *Students with AP CS credit plus a passing score in the CS 18000 Proficiency Exam (as described above) may use their AP credit in place of CS 18000 as a pre-requisite for other CS courses, but AP credit will not count toward the five (5) CS courses. In this case, the student must choose three of the Elective Courses.
• **Math majors may use MA 37500 in place of CS 18200 as a pre-requisite for other CS courses, but MA 37500 will not count toward the five (5) CS courses. In this case, the student must choose three of the Elective Courses.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Pre-Program

Data Science First Year (CS)

Data Science First Year

Program Requirements (25-28 credits)

Must have a "C" or better in all courses.

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 * (satisfies Computing and Teambuilding for College of Science core)
• CS 18200 - Foundations Of Computer Science Credits: 3.00 *
• CS 38003 - Python Programming Credits: 1.00
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First Year Composition Selection - Credit Hours: 3.00-4.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 4.00
Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *
- CS 19300 - Tools Credits: 1.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 3.00
- Electives - Credit Hours: 1.00

16-18 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00 *
- CS 38003 - Python Programming Credits: 1.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First Year Composition Selection - Credit Hours: 3.00 - 400
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00

15-17 Credits

Notes

- Enrollment in freshman seminar course CS 19300 - Tools is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement.
- *All CS, MA, and STAT courses required for the major, must be completed with a grade of "C" or better.
- *All prerequisites to CS, MA, and STAT courses required for the major, regardless of department, must be completed with a grade of "C" or better.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

Department of Earth, Atmospheric, and Planetary Sciences

Overview

The Department of Earth, Atmospheric, and Planetary Sciences (EAPS) is dedicated to providing a top-rate education for undergraduate and graduate students, as well as being dedicated to contributing to our sciences through research. EAPS is the multidisciplinary department of the College of Science, requiring the use of mathematics, physics, chemistry, statistics, and computer science to research problems; along with state of the art computer and laboratory facilities for calculation, visualization, and experimentation. Our programs intersect disciplines, with faculty and students studying in fields such as energy and the environment, severe weather science, planetary exploration, and geodata science. Our faculty, students and staff are dedicated to the department's mission, strategic plan, and fostering an environment of diversity and inclusivity. Guided by our values, we continue to expand, recruiting top-notch academic staff. I welcome you to contact us or check our website at eaps.purdue.edu if you are interested in learning more about the work that we do and the programs that we offer.

Department of Earth, Atmospheric, and Planetary Sciences Website

Faculty

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.

Bachelor of Science

Atmospheric Science, BS

About the Program
Atmospheric science focuses on mathematics, physics, chemistry, computer science, and statistics as well as atmospheric science. In this major students have several electives credits which they can use to broaden and enhance their educational experience and to specialize in the areas of weather forecasting, research, environmental monitoring, business, or broadcasting. Students can also participate in real-world forecasting, field work, and related opportunities. Research is an integral part of the program, and the Earth, Atmospheric, and Planetary Sciences (EAPS) Department has an excellent faculty to student ratio which allows students to have one-to-one interaction with their professors.

Atmospheric Science/Meteorology Website

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (39 credits)

Required Major Courses

- EAPS 11700 - Introduction To Atmospheric Science Credits: 3.00 ♦ (satisfies Science for core)
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00 ♦
- EAPS 22500 - Science Of The Atmosphere Credits: 3.00 ♦ (satisfies Science for core)
- EAPS 22700 - Introduction To Atmospheric Observation And Measurements Credits: 3.00
- EAPS 23001 - Laboratory In Atmospheric Science: Introduction To Weather And Climate Datasets Credits: 2.00
- EAPS 42100 - Atmospheric Thermodynamics Credits: 3.00
- EAPS 42200 - Atmospheric Dynamics I Credits: 3.00
- EAPS 42300 - Atmospheric Dynamics II Credits: 3.00
- EAPS 42501 - Physics Of Climate Credits: 3.00
- EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data Credits: 3.00
- EAPS 53200 - Atmospheric Physics I Credits: 3.00
- EAPS 10000-level Earth System Selective - Credit Hours: 3.00
- EAPS 40000/50000 Selective - Credit Hours: 6.00

Other Departmental/Program Course Requirements (51-72 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ Labeled as a Science Core Selection in the four year plan of study

*Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)
Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

**Technical Writing And Presentation** (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.**
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing (2-4 credits)**

- CS 15900 - C Programming **Credits:** 3.00
- CS 17600 - Data Engineering In Python **Credits:** 3.00
- CS 17700 - Programming With Multimedia Objects **Credits:** 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00
- ECE 49500 - Selected Topics In Electrical And Computer Engineering **Credits:** 1.00 to 4.00 - (Intro to Computer Systems - Credit Hours: 3.00)
- ENGR 14200 - Honors Creativity And Innovation In Engineering Design II **Credits:** 3.50
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II **Credits:** 4.00
- TDM 10100 - The Data Mine Seminar I **Credits:** 1.00 and
- TDM 10200 - The Data Mine Seminar II **Credits:** 1.00

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses **COULD** satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses **COULD** satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one course from this list.

**Laboratory Science (8 credits)**
Required

- PHYS 17200 - Modern Mechanics Credits: 4.00 (satisfies Science for core)
  Choose one option.
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00 and
- PHYS 25200 - Electricity And Optics Laboratory Credits: 1.00

Mathematics (8-10 credits)
(satisfies Quantitative Reasoning for core; students should earn a minimum of a C-)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (1-3 credits)
Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)
Choose one.

- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00

Team-Building and Collaboration

Met with PHYS 17200.

Required Pre-Requisite Courses (14-16 credits)

- MA 26500 - Linear Algebra Credits: 3.00
- MA 26600 - Ordinary Differential Equations Credits: 3.00 (Student should earn minimum of a C-)
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- CHM 11500 - General Chemistry Credits: 4.00 ♦ (satisfies Science for core) or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦ (satisfies Science for core)

Electives (9-30 credits)

Supplemental List

Click for Atmospheric Science Supplemental Information.
Grade Requirements

- All courses, with the exception of Language & Culture, General Education, and Electives, must have a grade of C- or higher. All EAPS courses, regardless of area in plan of study, must have a grade of C- or higher.

GPA Requirements

- 2.0 Graduation GPA required for Bachelor of Science degree
- 2.0 average in EAPS major classes required to graduate

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- EAPS 11700 - Introduction To Atmospheric Science Credits: 3.00
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00
- CHM 11500 - General Chemistry Credits: 4.00 or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core - Credit Hours: 3.00-4.00

15-18 Credits

Spring 1st Year

- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- EAPS 10000-level Earth System Elective - Credit Hours: 3.00
- Science Core: Computing Selective - Credit Hours: 2.00-4.00
- Science Core - Credit Hours: 3.00-4.00

12-16 Credits
Fall 2nd Year

- EAPS 22500 - Science Of The Atmosphere Credits: 3.00 ♦
- EAPS 22700 - Introduction To Atmospheric Observation And Measurements Credits: 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00-4.00

17-19 Credits

Spring 2nd Year

- EAPS 23001 - Laboratory In Atmospheric Science: Introduction To Weather And Climate Datasets Credits: 2.00
- MA 26500 - Linear Algebra Credits: 3.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Science Core Selection - Statistics- Credit Hours: 3.00

15 Credits

Fall 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- EAPS 42100 - Atmospheric Thermodynamics Credits: 3.00
- EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data Credits: 3.00
- MA 26600 - Ordinary Differential Equations Credits: 3.00
- Elective - Credit Hours: 0.00-2.00

12-14 Credits

Spring 3rd Year

- EAPS 42200 - Atmospheric Dynamics I Credits: 3.00
- EAPS 53200 - Atmospheric Physics I Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 3.00-4.00

13-16 Credits

Fall 4th Year

- EAPS 42300 - Atmospheric Dynamics II Credits: 3.00
- Great Issues In Science Option - Credit Hours: 3.00
- EAPS 40000/50000 Selective - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-4.00
• Elective - Credit Hours: 3.00-4.00

12-17 Credits

Spring 4th Year

• EAPS 42501 - Physics Of Climate Credits: 3.00
• EAPS 40000/50000 Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 2.00-4.00
• Elective - Credit Hours: 1.00-4.00

12-17 Credits

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

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Environmental Geoscience, BS
About the Program

The EAPS Environmental Geoscience major offers an interdisciplinary curriculum that immerses students in the fundamentals of geology, chemistry, atmospheric science, biology, math, and physics. This coursework prepares students so they can help solve challenging environmental problems such as climate change, emerging pollutants, shrinking and shifting energy resources, food production, and ecology. The Environmental Geoscience major at Purdue is flexible, allowing students to create their own coursework focus based on their particular scientific passion: air quality, soil and sediments, or hydrology. Undergraduate research is required in this major, and students have the opportunity to work directly with professors and industry leaders. Graduates develop quantitative problem-solving skills that make them highly competitive for further graduate school studies related to environmental science or careers in environmental monitoring, consulting, and decision support for environmental public policy.

Environmental Geoscience Website

Earth, Atmospheric, and Planetary Sciences Department Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (54 credits)

Required Major Courses

- AGRY 25500 - Soil Science Credits: 3.00
- CHM 22400 - Introductory Quantitative Analysis Credits: 4.00
  or
- CHM 32100 - Analytical Chemistry I Credits: 4.00
- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00
- EAPS 20000 - Water World: Processes And Challenges In Global Hydrology Credits: 3.00
- EAPS 22500 - Science Of The Atmosphere Credits: 3.00
- EAPS 24300 - Mineralogy Credits: 4.00
- EAPS 31500 - Biogeochemistry Credits: 3.00
- EEE 36000 - Environmental And Ecological Engineering Laboratory Credits: 1.00 to 3.00 (Credit Hours: 3.00)
  or
- ASM 54000 - Geographic Information System Application Credits: 3.00
- EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00 Title: Geospatial Analysis in Earth and Planetary Contexts
  or
- FNR 21000 - Natural Resource Information Management Credits: 3.00
  or
- ILS 25000 - Introduction To Geographic Information Systems Credits: 3.00
- EAPS 10900 - The Dynamic Earth Credits: 3.00
  or
- EAPS 12500 - Environmental Science And Conservation Credits: 3.00
- AGEC 20400 - Introduction To Resource Economics And Environmental Policy Credits: 3.00
  or
- POL 22300 - Introduction To Environmental Policy Credits: 3.00
- EAPS 38500 - Principles Of Engineering Geology Credits: 3.00
  or
- EEE 35500 - Engineering Environmental Sustainability Credits: 3.00
- EAPS 49700 - Earth And Atmospheric Sciences Undergraduate Readings And Research Credits: 1.00 to 6.00 (Credit Hours: 3.00)
  or
- EAPS 41900 - Internship In Environmental Geosciences Credits: 1.00 to 6.00 (Credit Hours: 3.00)
- Environmental Selective\* - Credit Hours: 12.00 total

Other Departmental/Program Course Requirements (41-68 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS
Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found HERE. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

Choose one.

- CS 15900 - C Programming Credits: 3.00
- CS 17600 - Data Engineering In Python Credits: 3.00
- CS 17700 - Programming With Multimedia Objects Credits: 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- ECE 49500 - Selected Topics In Electrical And Computer Engineering Credits: 1.00 to 4.00 - (Intro to Computer Systems - Credit Hours: 3.00)
- ENGR 14200 - Honors Creativity And Innovation In Engineering Design II Credits: 3.50
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II Credits: 4.00
- TDM 10100 - The Data Mine Seminar I Credits: 1.00
- TDM 10200 - The Data Mine Seminar II Credits: 1.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).
General Education Option I
General Education Option II
General Education Option III

Great Issues In Science (3 credits)

Choose one course from this list.

Laboratory Science (8-10 credits)

(satisfies Science for core)

- CHM 11500 - General Chemistry Credits: 4.00 ♦
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 ♦
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 ♦

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core; students should earn a minimum of a C-)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

Choose one.

- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Can be met with PHYS 17200.

Required Pre-Requisite Course (4 credits)

Physics Selective - Choose one option.
• PHYS 17200 - Modern Mechanics Credits: 4.00
• PHYS 22000 - General Physics Credits: 4.00
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00 (if two semesters of Biology)

Electives (0-25 credits)

Supplemental List

Click for Environmental Geoscience Supplemental Information.

Grade Requirements

• All courses, with the exception of Language & Culture, General Education, and Electives, must have a grade of C- or higher. All EAPS courses, regardless of area in plan of study, must have a grade of C- or higher.

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree
• 2.0 average in EAPS major courses required to graduate

Course Requirements and Notes

• ^Environmental Selectives for advanced courses and specializations
• ^^Environmental Selectives with Labs for advanced courses and specializations
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.
University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00
- CHM 11500 - General Chemistry Credits: 4.00 or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
15-18 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 ♦ or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00 ♦
- EAPS 10900 - The Dynamic Earth Credits: 3.00 ♦ or
- EAPS 12500 - Environmental Science And Conservation Credits: 3.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 ♦ or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First-Year Composition Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 0.00-1.00

15-17 Credits

Fall 2nd Year

- AGRY 25500 - Soil Science Credits: 3.00
- EAPS 22500 - Science Of The Atmosphere Credits: 3.00
- EAPS 24300 - Mineralogy Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00

16-17 Credits

Spring 2nd Year

- EAPS 20000 - Water World: Processes And Challenges In Global Hydrology Credits: 3.00
- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00 or
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ or
- PHYS 22000 - General Physics Credits: 4.00 ♦ or
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00 ♦
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- CHM 32100 - Analytical Chemistry I Credits: 4.00
- EAPS 31500 - Biogeochemistry Credits: 3.00
- EEE 36000 - Environmental And Ecological Engineering Laboratory Credits: 1.00 to 3.00
- EAPS 38500 - Principles Of Engineering Geology Credits: 3.00 or
• EEE 35500 - Engineering Environmental Sustainability Credits: 3.00

13 Credits

Spring 3rd Year

• AGEC 20400 - Introduction To Resource Economics And Environmental Policy Credits: 3.00 or
• POL 22300 - Introduction To Environmental Policy Credits: 3.00
  • Environmental Selective - Credit Hours 3.00
  • Science Core Selection - Credit Hours: 2.00-4.00
  • Science Core Selection - Credit Hours: 3.00
  • Elective - Credit Hours: 3.00

13-14 Credits

Fall 4th Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• ASM 54000 - Geographic Information System Application Credits: 3.00 or
• FNR 21000 - Natural Resource Information Management Credits: 3.00
  • Environmental Selective - Credit Hours: 3.00
  • Elective - Credit Hours: 3.00

12-15 Credits

Spring 4th Year

• EAPS 49700 - Earth And Atmospheric Sciences Undergraduate Readings And Research Credits: 1.00 to 6.00 or
• EAPS 41900 - Internship In Environmental Geosciences Credits: 1.00 to 6.00
  • Environmental Selective - Credit Hours: 3.00
  • Great Issues In Science Selective - Credit Hours: 3.00
  • Science Core Selection - Credit Hours: 1.00-3.00
  • Elective - Credit Hours: 0.00-4.00
  • Elective - Credit Hours: 1.00-2.00

13-16 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-
Critical Course

The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Geology and Geophysics, BS

About the Program

Within the geology and geophysics major, students study math, chemistry, physics, and enroll in coursework in physical and historical geology, earth materials, surface processes, plate tectonics, structural geology, sedimentation and stratigraphy, computer-aided analysis, field methods, and a summer geology field camp. Students have a number of electives which can be used to take advanced coursework in seismology, crustal tectonics, engineering geology, hydrogeology, and a wide variety of other topics relevant to geologists. Faculty led classes, labs, and field experiences as well as undergraduate research (encouraged) are all components of this program.

Geology and Geophysics Website

Earth, Atmospheric, and Planetary Sciences Department Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

• Composition and Presentation
• Computing
• Cultural Diversity (Language and Culture)
• General Education
• Great Issues in Science
• Laboratory Science
• Mathematics
• Science Technology and Society
• Statistics
• Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Degree Requirements**

**120 Credits Required**

**Departmental/Program Major Courses**

**Required Major Courses (49 credits)**

• EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
• EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00 ♦
• EAPS 24300 - Mineralogy Credits: 4.00 ♦ (satisfies Science for core)
• EAPS 24400 - Earth Materials II Credits: 4.00
• EAPS 30900 - Computer-Aided Analysis For Geosciences Credits: 3.00
• EAPS 35200 - Structural Geology Credits: 3.00
• EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
• EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
• EAPS 47400 - Sedimentary Geology Credits: 4.00
• EAPS 47500 - Geology And Geophysics Field Camp - Wasatch-Uinta Field Camp Credits: 6.00
• EAPS 11200 - Earth Through Time Credits: 3.00 ♦ (satisfies Science for core) or
• EAPS 31900 - Exploring Earth Through Time Credits: 3.00 ♦ (satisfies Science for core)
• EAPS Professional Elective (EAPS 30000:59900) - Credit Hours: 3.00
• Science/Engineering Elective (Level 20000:59900) - Credit Hours: 3.00

Other Departmental/Program Course Requirements (45-72 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ Labeled as a Science Core Selection in the four year plan of study

*Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found HERE. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00
• CS 17600 - Data Engineering In Python Credits: 3.00
• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• ECE 49500 - Selected Topics In Electrical And Computer Engineering Credits: 1.00 to 4.00 - (Intro to Computer Systems - Credit Hours: 3.00)
• ENGR 14200 - Honors Creativity And Innovation In Engineering Design II Credits: 3.50
• ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II Credits: 4.00
• TDM 10100 - The Data Mine Seminar I Credits: 1.00 and
• TDM 10200 - The Data Mine Seminar II Credits: 1.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one course from this list.

Laboratory Science (8 credits)

(satisfies Science for core)

• PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ or
• PHYS 22000 - General Physics Credits: 4.00 ♦
• PHYS 22100 - General Physics Credits: 4.00 or
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core; students should earn a minimum of a C-)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).
Statistics (3 credits)

Choose one.

- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Courses (8-10 credits)

- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 ♦ or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00

Electives (0-26 credits)

Grade Requirements

- All courses, with the exception of Language & Culture, General Education, and Electives, must have a grade of C- or higher.
- All EAPS courses, regardless of area in plan of study, must have a grade of C- or higher.

GPA Requirements

- 2.0 Graduation GPA required for Bachelor of Science degree
- 2.0 average in EAPS major classes required to graduate

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill *most, if not all*, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Sample 4-Year Plan

Fall 1st Year

- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00
- CHM 11500 - General Chemistry Credits: 4.00 or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (Student should earn minimum of a C-) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (Student should earn minimum of a C-)
- Science Core Selection - Credit Hours: 3.00-4.00

15-18 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
- EAPS 11200 - Earth Through Time Credits: 3.00 or
- EAPS 31900 - Exploring Earth Through Time Credits: 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (Student should earn minimum of a C-) or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (Student should earn minimum of a C-)
- Science Core First-Year Composition Selection – Credit Hours: 3.00-4.00

14-17 Credits

Fall 2nd Year

- EAPS 24300 - Mineralogy Credits: 4.00
- PHYS 17200 - Modern Mechanics Credits: 4.00 or
- PHYS 22000 - General Physics Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science/Engineering Elective (Level 20000 to 59900) - Credit Hours: 3.00

14-15 Credits

Spring 2nd Year

- EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
- PHYS 22100 - General Physics Credits: 4.00 or
- PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
- Science/Engineering Elective (Level 20000 to 59900) - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

13-14 Credits
Fall 3rd Year

- EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
- EAPS 47400 - Sedimentary Geology Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Computing Science Core Selection - Credit Hours: 2.00-4.00

12-14 Credits

Spring 3rd Year

- EAPS 24400 - Earth Materials II Credits: 4.00
- EAPS 30900 - Computer-Aided Analysis For Geosciences Credits: 3.00
- EAPS 35200 - Structural Geology Credits: 3.00
- EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00 or
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 50300 - Statistical Methods For Biology Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00
- Team-Building & Collaboration - Credit Hours: 0.00-3.00

13-16 Credits

Summer 3rd Year

- EAPS 47500 - Geology And Geophysics Field Camp - Wasatch-Uinta Field Camp Credits: 6.00

6 Credits

Fall 4th Year

- EAPS Professional Elective (EAPS 30000:59900) - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Great Issues In Science - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-3.00

12-15 Credits

Spring 4th Year
• COM 21700 - Science Writing And Presentation Credits: 3.00
• EAPS Professional Elective (EAPS 30000:59900) - Credit Hours: 3.00
• Elective - Credit Hours: 2.00-3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00-3.00

12-15 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Planetary Sciences, BS

About the Program
Planetary sciences is a multidisciplinary study of planetary dynamics and includes coursework in planetary geology, planetary atmospheres, planetary physics, spacecraft design and operation, and astronomy with elective options in astrobiology, impact cratering, and related topics with which to focus their study. All students receive a strong background in math, chemistry, physics, computer science, geophysics, and remote sensing and are encouraged to get involved in undergraduate research in this unique program.

Planetary Sciences Website

Earth, Atmospheric, and Planetary Sciences Department Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience
Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Degree Requirements

120 Credits Required

Departmental/Program Major Courses (35 credits)

Required Major Courses (23 credits)

- EAPS 10500 - The Planets Credits: 3.00 ♦ (satisfies Science for core)
- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00 ♦
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00 ♦
- EAPS 24300 - Mineralogy Credits: 4.00
- EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
- EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
- EAPS 44500 - Spacecraft Design Credits: 3.00

Skills Selective (3 credits)

- EAPS 30900 - Computer-Aided Analysis For Geosciences Credits: 3.00
- EAPS 57700 - Remote Sensing Of The Planets Credits: 3.00
- EAPS 52400 - Laboratory Analysis Credits: 3.00
- EAPS 55501 - Numerical Modeling Of Planetary Orbits Credits: 3.00
- EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00
  - Geospatial Analysis in Earth and Planetary Contexts - Credit Hours: 3.00

EAPS Selective (3 credits)

- Choose an EAPS course not taken above.
- EAPS 10000:59900 - (could satisfy Science, Technology, & Society for core) - Credit Hours: 3.00

Planetary Science Selectives (9 credits)

Choose 9 credits from this list: Planetary Science Supplemental Information. One course cannot be used to meet both Major Course and Planetary Science Selective.

Other Departmental/Program Course Requirements (53-80 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ Labeled as a Science Core Selection in the four year plan of study

*Requirement may be met with a zero credit experiential learning option. See your advisor for more information.
Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- **Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.**
- **International Students Only:** International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (2-4 credits)

Choose one.

- CS 15900 - C Programming **Credits:** 3.00
- CS 17600 - Data Engineering In Python **Credits:** 3.00
- CS 17700 - Programming With Multimedia Objects **Credits:** 4.00
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00
- ECE 49500 - Selected Topics In Electrical And Computer Engineering **Credits:** 1.00 to 4.00 -Intro to Computer
- ENGR 14200 - Honors Creativity And Innovation In Engineering Design II **Credits:** 3.50
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II **Credits:** 4.00
- TDM 10100 - The Data Mine Seminar I **Credits:** 1.00 and
- TDM 10200 - The Data Mine Seminar II **Credits:** 1.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)
Choose one course from this list.

Laboratory Science (8 credits)

*(satisfies Science for core)*

- PHYS 17200 - Modern Mechanics *Credits: 4.00*
- PHYS 27200 - Electric And Magnetic Interactions *Credits: 4.00 or*
- PHYS 24100 - Electricity And Optics *Credits: 3.00 and*
- PHYS 25200 - Electricity And Optics Laboratory *Credits: 1.00*

Mathematics (8-10 credits)

*(satisfies Quantitative Reasoning for core; students should earn a minimum of a C-)*

- MA 16100 - Plane Analytic Geometry And Calculus I *Credits: 5.00 or*
- MA 16500 - Analytic Geometry And Calculus I *Credits: 4.00*
- MA 16200 - Plane Analytic Geometry And Calculus II *Credits: 5.00 or*
- MA 16600 - Analytic Geometry And Calculus II *Credits: 4.00*

Science Technology and Society^* (1-3 credits)

Choose one from the Science Technology and Society list here. *(satisfies STS for core).*

Statistics (3 credits)

*Choose one.*

- EAPS 31000 - Introductory Statistics For Geosciences *Credits: 3.00*
- STAT 30100 - Elementary Statistical Methods *Credits: 3.00*
- STAT 35000 - Introduction To Statistics *Credits: 3.00*
- STAT 50300 - Statistical Methods For Biology *Credits: 3.00*
- STAT 51100 - Statistical Methods *Credits: 3.00*

Required Pre-Requisite Courses (16-18 credits)

- MA 26100 - Multivariate Calculus *Credits: 4.00* *(Student should earn minimum of a C-)*
- MA 26200 - Linear Algebra And Differential Equations *Credits: 4.00*
- CHM 11500 - General Chemistry *Credits: 4.00 or*
- CHM 12500 - Introduction To Chemistry I *Credits: 5.00*
- CHM 11600 - General Chemistry *Credits: 4.00 or*
- CHM 12600 - Introduction To Chemistry II *Credits: 5.00*

Electives (5-34 credits)

Grade Requirements

- All courses, with the exception of Language & Culture, General Education, and Electives, must have a grade of C- or higher.
• All EAPS courses, regardless of area in plan of study, must have a grade of C- or higher.

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree
• 2.0 average in EAPS major courses required to graduate

Course Requirements and Notes

• One course cannot be used to meet both Major Course and Planetary Science Selective.
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

- ^Planetary Science Selectives for advanced courses and specializations

Sample 4-Year Plan

Fall 1st Year

- EAPS 11800 - Introduction To Earth Sciences Credits: 3.00 ♦
- EAPS 13700 - Freshman Seminar In Earth, Atmospheric, And Planetary Sciences Credits: 1.00 ♦
- CHM 11500 - General Chemistry Credits: 4.00 ♦ or
- CHM 12500 - Introduction To Chemistry I Credits: 5.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection First-Year Composition - Credit Hours: 3.00 - 4.00

15-18 Credits

Spring 1st Year

- EAPS 10500 - The Planets Credits: 3.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- CHM 11600 - General Chemistry Credits: 4.00 ♦ or
- CHM 12600 - Introduction To Chemistry II Credits: 5.00
• Science Core Selection Language & Culture - Credit Hours: 3.00-4.00

14-17 Credits

Fall 2nd Year

• EAPS 24300 - Mineralogy Credits: 4.00
• MA 26100 - Multivariate Calculus Credits: 4.00
• PHYS 17200 - Modern Mechanics Credits: 4.00
• Science Core Selection Language & Culture - Credit Hours: 3.00-4.00

15-16 Credits

Spring 2nd Year

• CS 17700 - Programming With Multimedia Objects Credits: 4.00
• MA 26200 - Linear Algebra And Differential Equations Credits: 4.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 or
• PHYS 24100 - Electricity And Optics Credits: 3.00 and PHYS 25200 - Electricity And Optics Laboratory
• Science Core Selection Language & Culture - Credit Hours: 3.00-4.00

13-16 Credits

Fall 3rd Year

• EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
• Science Core Selection TWTP (COM 21700 strongly recommended) - Credit Hours: 3.00
• Science Core Selection General Education - Credit Hours: 3.00
• Planetary Science OR Skills Selective\ - Credit Hours: 3.00
• Elective - Credit Hours: 3.00-4.00

15-16 Credits

Spring 3rd Year

• EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
• EAPS 31000 - Introductory Statistics For Geosciences Credits: 3.00 or
• STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
• STAT 35000 - Introduction To Statistics Credits: 3.00 or
• STAT 50300 - Statistical Methods For Biology Credits: 3.00 or
• STAT 51100 - Statistical Methods Credits: 3.00
• Planetary Science or Skills Selective^ - Credit Hours: 3.00
• Science Core Selection General Education - Credit Hours: 3.00
• Elective - Credit Hours: 2.00-4.00

14-16 Credits
Fall 4th Year

- EAPS Selective - Credit Hours: 3.00
- Planetary Science or Skills Selective - Credit Hours: 3.00
- Science Technology and Society - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 0.00-4.00

12-15 Credits

Spring 4th Year

- EAPS 44500 - Spacecraft Design Credits: 3.00
- Planetary Science or Skills Selective - Credit Hours: 3.00
- Science Core Selection Great Issues in Science - Credit Hours: 3.00
- Science Core Selection General Education - Credit Hours: 3.00
- Electives - Credit Hours: 0.00-4.00

12-16 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Minor**

**Atmospheric Science Minor**

**About the Minor**

The Atmospheric Science minor allows students to study severe storms, climate change, and environmental impacts. Courses available for the minor provide valuable hands-on experience in areas ranging from meteorological measurements, severe weather forecasting, and analyzing global changes over time. This provides students with skills in important areas including weather forecasting, climate modeling, and air pollution.

**Requirements for the Minor (15 credits)**

**Required Course (3 credits)**

- EAPS 22100 - Survey Of Atmospheric Science **Credits: 3.00**
- EAPS 22500 - Science Of The Atmosphere **Credits: 3.00**

**Additional EAPS Coursework (12 credits)**

- Two EAPS 20000-level or higher courses
- Two EAPS 30000-level or higher courses
- EAPS 23000 - Laboratory In Atmospheric Science **Credits: 2.00**
- EAPS 22700 - Introduction To Atmospheric Observation And Measurements **Credits: 3.00**
- EAPS 32500 - Aviation Meteorology **Credits: 3.00** or
- AT 32501 - Advanced Aviation Meteorology **Credits: 3.00**
- EAPS 32700 - Climate, Science And Society **Credits: 3.00**
- AGRY 33500 - Weather And Climate **Credits: 3.00**
- EAPS 36700 - Survey Of Planetary Atmospheres **Credits: 3.00**
- EAPS 42100 - Atmospheric Thermodynamics **Credits: 3.00**
- EAPS 42200 - Atmospheric Dynamics I **Credits: 3.00**
- EAPS 42300 - Atmospheric Dynamics II **Credits: 3.00**
- EAPS 43100 - Synoptic Laboratory I **Credits: 1.00**
- EAPS 43200 - Synoptic Laboratory II **Credits: 1.00**
- EAPS 43300 - Synoptic Lab III **Credits: 1.00**
- EAPS 43400 - Weather Analysis And Forecasting **Credits: 3.00**
- EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data **Credits: 3.00**
- EAPS 51000 - Climate Time Series Analysis **Credits: 3.00**
- EAPS 52000 - Theory Of Climate **Credits: 3.00**
- EAPS 52100 - Atmospheric Chemistry **Credits: 3.00**
• EAPS 52300 - Radar Meteorology Credits: 3.00
• EAPS 52500 - Boundary Layer Meteorology Credits: 3.00 or
• AGRY 53500 - Boundary Layer Meteorology Credits: 3.00
• EAPS 53000 - Extreme Weather And Climate: Science And Risk Credits: 3.00
• EAPS 53200 - Atmospheric Physics I Credits: 3.00
• EAPS 53300 - Atmospheric Physics II Credits: 3.00
• EAPS 53400 - Tropical Meteorology Credits: 3.00
• EAPS 53600 - Introduction To General Circulation Credits: 3.00
• EAPS 53900 - Mesoscale Meteorology Credits: 3.00

Variable Title Courses (see advisor for section titles and exceptions)
• EAPS 39100 - Topics In Earth And Atmospheric Sciences Credits: 1.00 to 4.00
• EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00

Notes

• Students must receive a C- or better in all courses with a minor GPA of 2.0 or higher.
• All courses for the minor must be atmosphere-related courses.
• Must have department permission to use EAPS 39100, or EAPS 59100 courses towards minor requirements. Course titles and topics must be Atmospheric related to be used for the minor.
• No credit allowed for EAPS 49700 towards minor requirements
• All courses for this minor must be taken at Purdue University West Lafayette
• All courses used for the minor must be taken for a letter grade.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Earth and Planetary Sciences Minor

Requirements for the Minor (15 credits)

Required Course (3 credits)

Choose one:

• EAPS 10500 - The Planets Credits: 3.00
• EAPS 10900 - The Dynamic Earth Credits: 3.00
• EAPS 11100 - Physical Geology Credits: 3.00
• EAPS 11800 - Introduction To Earth Sciences Credits: 3.00

Additional EAPS Coursework (12 credits)

• One EAPS 10000-level or higher course
• One EAPS 20000-level or higher course
• Two EAPS 30000-level or higher courses

Earth & Planetary Science Minor Course List

• EAPS 10000 - Planet Earth Credits: 3.00
• EAPS 10400 - Oceanography Credits: 3.00
• EAPS 10500 - The Planets Credits: 3.00
• EAPS 10600 - Geosciences In The Cinema Credits: 3.00
• EAPS 10900 - The Dynamic Earth Credits: 3.00
• EAPS 11000 - Physical Geology Credits: 3.00
• EAPS 11100 - Earth Through Time Credits: 3.00
• EAPS 11600 - Earthquakes And Volcanoes Credits: 3.00
• EAPS 11800 - Introduction To Earth Sciences Credits: 3.00
• EAPS 12000 - Introduction To Geography Credits: 3.00
• EAPS 19100 - Introductory Topics In Earth And Atmospheric Science Credits: 1.00 to 3.00
• EAPS 20000 - Water World: Processes And Challenges In Global Hydrology Credits: 3.00
• EAPS 12500 - Environmental Science And Conservation Credits: 3.00 or
  AGRY 12500 - Environmental Science And Conservation Credits: 3.00 or
• FNR 12500 - Environmental Science And Conservation Credits: 3.00 or
• NRES 12500 - Environmental Science And Conservation Credits: 3.00
• EAPS 24300 - Mineralogy Credits: 4.00
• EAPS 24400 - Earth Materials II Credits: 4.00
• EAPS 30900 - Computer-Aided Analysis For Geosciences Credits: 3.00
• EAPS 31201 - Earth Systems Science For Elementary Teachers Credits: 3.00
• EAPS 31500 - Biogeochemistry Credits: 3.00
• EAPS 31900 - Exploring Earth Through Time Credits: 3.00
• EAPS 32700 - Climate, Science And Society Credits: 3.00
• EAPS 35200 - Structural Geology Credits: 3.00
• EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
• EAPS 35400 - Earth And Planetary Geophysics Credits: 3.00
• EAPS 36000 - Great Issues In Climate Change And Society Credits: 3.00
• EAPS 36700 - Survey Of Planetary Atmospheres Credits: 3.00
• EAPS 37500 - Great Issues - Fossil Fuels, Energy And Society Credits: 3.00
• EAPS 39000 - Geologic Field Methods Credits: 3.00
• EAPS 39100 - Topics In Earth And Atmospheric Sciences Credits: 1.00 to 4.00
• EAPS 39500 - Astrobiology Credits: 3.00
• EAPS 47400 - Sedimentary Geology Credits: 4.00
• EAPS 50600 - Cosmochemistry And Geochemistry Credits: 3.00
• EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data Credits: 3.00
• EAPS 51400 - Glacial And Quaternary Geology Credits: 3.00
• EAPS 51800 - Soil Biogeochemistry Credits: 3.00
• EAPS 52600 - Introductory Geofluid Dynamics Credits: 3.00
• EAPS 52900 - Modeling Ecosystems And Biogeochemical Cycles Credits: 3.00
• EAPS 54200 - Economic Geology: Petroleum Credits: 3.00
• EAPS 55600 - Planetary Surface Processes Credits: 3.00
• EAPS 55700 - Introduction To Seismology Credits: 3.00
• EAPS 55900 - Topics In Seismology Credits: 1.00 to 3.00
• EAPS 57300 - Basin Analysis Credits: 3.00
• EAPS 57700 - Remote Sensing Of The Planets Credits: 3.00
• EAPS 58000 - Geodynamics Credits: 3.00
• EAPS 58400 - Hydrogeology Credits: 3.00
• EAPS 59000 - Field Geology North America Credits: 2.00
• EAPS 59100 - Advanced Topics In Earth And Atmospheric Sciences Credits: 0.00 to 18.00

Notes

• To qualify for the minor, classes must be completed with a cumulative GPA of 2.0 or better.
• No Atmospheric classes may be taken for the Earth and Planetary minor.
• Credit is allowed in any EAPS 19100, EAPS 39100, or EAPS 59100 towards minor requirements with department approval and must be related to the area of interest.
• Credit allowed in no more than one EAPS 32700, EAPS 37500, EAPS 36000, or EAPS 36400 towards minor requirements.
• No credit allowed for EAPS 49700 towards minor requirements.
• No single course may be used to complete more than one minor requirement. Students must take five (5) separate courses to complete the minor.
• All courses for this minor must be taken at Purdue University West Lafayette
• All courses used for the minor must be taken for a letter grade.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

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Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Non-Degree

Atmospheric Science Supplemental Information

EAPS 400/500 Selective

• EAPS 43400 - Weather Analysis And Forecasting Credits: 3.00
• EAPS 51500 - Geodata Science Credits: 3.00
• EAPS 52000 - Theory Of Climate Credits: 3.00
• EAPS 52100 - Atmospheric Chemistry Credits: 3.00
• EAPS 52300 - Radar Meteorology Credits: 3.00
• EAPS 52500 - Boundary Layer Meteorology Credits: 3.00
• EAPS 53000 - Extreme Weather And Climate: Science And Risk Credits: 3.00
• EAPS 53400 - Tropical Meteorology Credits: 3.00
• EAPS 53600 - Introduction To General Circulation Credits: 3.00
• EAPS 53900 - Mesoscale Meteorology Credits: 3.00

Environmental Geoscience Supplemental Information

Environmental Selectives (12 Credits)

• AGRY 33700 - Environmental Hydrology Credits: 3.00
• AGRY 38500 - Environmental Soil Chemistry Credits: 4.00
• CE 54200 - Hydrology Credits: 3.00
• EAPS 22700 - Introduction To Atmospheric Observation And Measurements Credits: 3.00
• EAPS 35300 - Earth And Planetary Surface Processes Credits: 3.00
• EAPS 50700 - Introduction To Analysis And Computing With Geoscience Data Credits: 3.00
• EAPS 51800 - Soil Biogeochemistry Credits: 3.00
• EAPS 52100 - Atmospheric Chemistry Credits: 3.00
• EAPS 58400 - Hydrogeology Credits: 3.00
• ENGL 39300 - Interdisciplinary Approaches To Environmental And Sustainability Studies Credits: 3.00
• MA 26100 - Multivariate Calculus Credits: 4.00
• EAPS 38500 - Principles Of Engineering Geology Credits: 3.00 or
• EEE 35500 - Engineering Environmental Sustainability Credits: 3.00
  (one course cannot be used to meet both Major Course and Environmental Selective)

Planetary Science Supplemental Information

Planetary Science Selectives - Choose three. (9 Credits)

• ASTR 36300 - The Solar System Credits: 3.00
• EAPS 20500 - Fundamentals Of Planetary Science Credits: 3.00
• EAPS 31500 - Biogeochemistry Credits: 3.00
• EAPS 35200 - Structural Geology Credits: 3.00
• EAPS 36700 - Survey Of Planetary Atmospheres Credits: 3.00
• EAPS 39500 - Astrobiology Credits: 3.00
• EAPS 47400 - Sedimentary Geology Credits: 4.00
• EAPS 55600 - Planetary Surface Processes Credits: 3.00
• EAPS 58000 - Geodynamics Credits: 3.00
• Any Other 30000-50000 level planetary science course.
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 mathematics.

The Department offers Bachelor of Science and Doctor of Philosophy degrees. Bachelor of Science programs include Actuarial Science, Applied Mathematics, Core Mathematics, Data Science, Honors Mathematics, Mathematics and Computer Science, Mathematics for Business, Mathematics Education, and Mathematics and Statistics.

The Department's 70 professors are actively involved in current developments in many major areas of mathematics. Faculty research interests can be found in the Faculty Research Areas list in our Faculty directory.

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

Contact Information

The Department's Main Office (Room 835 of the MATH building) is open from 8am to 5pm on all weekdays, except University holidays. The main office is closed from 12 to 1 p.m. in the summer. 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

Undergraduate Programs

Undergraduate Mathematics Information
Admissions Information (Includes application forms and online application)

Graduate Information

For Graduate Information please see Mathematics Graduate Program Information.

Bachelor of Science
Actuarial Science Honors, BS

About the 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, students also earn a second major in Statistics and most also earn a minor in Management.

Actuarial Science Website

Actuarial Science Major Change (CODO) Requirements (Students must first CODO into Actuarial Science before Honors.)

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Degree Requirements

120 Credits Required

Departmental/Program Requirements (59 credits)

Required Major Courses (59 credits)

- ECON 25100 - Microeconomics Credits: 3.00 (satisfies General Education Option for College of Science Core)
- ECON 25200 - Macroeconomics Credits: 3.00 (satisfies Behavioral/Social Science for core)
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 37300 - Financial Mathematics Credits: 3.00 (satisfies Multidisciplinary Experience for College of Science Core)
- MGMT 20000 - Introductory Accounting Credits: 3.00
- MGMT 20100 - Management Accounting I Credits: 3.00
- MGMT 31000 - Financial Management Credits: 3.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 - Actuarial Science Capstone* 3.00 credit hours required
- MGMT 41100 - Investment Management Credits: 3.00 - Honors Investment Management is required if offered.
- STAT 41700 - Statistical Theory Credits: 3.00 *
- STAT 42000 - Introduction To Time Series Credits: 3.00
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00 * (satisfies Team-Building & Collaboration for College of Science core)
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives Credits: 3.00 *
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00 *
- STAT 47902 - Fundamental Short Term Actuarial Mathematics Credits: 3.00 *
- STAT 49000 - Topics In Statistics For Undergraduates: Statistics For Risk Modeling II* - Credit Hours: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- STAT 47501 - Advanced Long Term Actuarial Mathematics Credits: 3.00 * or
- MA 49000 - Topics In Mathematics For Undergraduates: Advanced Short Term Actuarial Mathematics - Credit Hours 3.00 *

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 Course Requirements (37-58 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CNIT 17500 - Visual Programming Credits: 3.00 ♦ or
• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).
• General Education Option I - fulfilled by ECON 25100 in major.
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

• Laboratory Science Option I
• Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦

Team-Building and Collaboration

Fulfilled by STAT 47201 in major.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (3-24 credits)
Grade Requirements

- Earn at least a "B-" in each of the following classes: ECON 25100, ECON 25200, MGMT 31000, and MGMT 41100.
- Earn grades of at least "B" in all of the MA and STAT classes in Required Major Courses.
- Student should strive to earn a C or better.

GPA Requirements

- Earn a cumulative GPA of at least 3.30.
- Earn a minimum GPA of 3.5 in the following set of classes: STAT 41700, STAT 47201, STAT 47301, STAT 47401 SRM, STAT 47501 or MA 49000 ASTAM, STAT 47902, STAT 49000-Actuarial Science Capstone, and STAT 49000 Statistics for Risk Modeling II (marked with a *).
- Earn a 2.50 GPA among required MA/STAT/MGMT/ECON classes in Required Major Courses.

Course Requirements and Notes

- A course can only be used once in the Major Course area.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

Non-course / Non-credit Requirements

Documentation of passing two exams given by the Society of Actuaries

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- ECON 25100 - Microeconomics Credits: 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 + or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 +
16-19 Credits

Spring 1st Year

- MA 37300 - Financial Mathematics Credits: 3.00 ♦
- CNIT 17500 - Visual Programming Credits: 3.00 ♦ or
- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 0.00-2.00

15-16 Credits

Fall 2nd Year

- ECON 25200 - Macroeconomics Credits: 3.00
- MGMT 20000 - Introductory Accounting Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00-4.00

16-18 Credits

Spring 2nd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MGMT 20100 - Management Accounting I Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- Elective - Credit Hours: 0.00-3.00 (recommend STAT 25000)

12-15 Credits

Fall 3rd Year
- MGMT 31000 - Financial Management Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00 *
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00 *
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

- STAT 42000 - Introduction To Time Series Credits: 3.00 *
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00 *
- MGMT 41100 - Investment Management Credits: 3.00 - Honors Investment Management is required if offered.
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Fall 4th Year

- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives Credits: 3.00 *
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 Statistics For Risk Modeling II - Credit Hours: 3.00
- STAT 47501 - Advanced Long Term Actuarial Mathematics Credits: 3.00 *
  OR Elective - Credit Hours: 3.00
- Great Issues In Science Option - Credit Hours: 3.00

12 Credits

Spring 4th Year

- MA 36600 - Ordinary Differential Equations Credits: 4.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 Actuarial Science Capstone - Credit Hours: 3.00
- STAT 47902 - Fundamental Short Term Actuarial Mathematics Credits: 3.00
- Science Core Course - Credit Hours: 1.00-3.00
- Electives - Credit Hours: 0.00-1.00

12-13 Credits
World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL—American Sign Language; ARAB—Arabic; CHNS—Chinese; FR—French; GER—German; GREK—Greek(Ancient); HEBR—Hebrew(Biblical); HEBR—Hebrew(Modern); ITAL—Italian; JPNS—Japanese; KOR—Korean; LATN—Latin; PTGS=Portuguese; RUSS—Russian; SPAN—Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Actuarial Science, BS

About the 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, students also earn a second major in Statistics and most also earn a minor in Management.

Actuarial Science Website

Actuarial Science Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science
A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the preceding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Degree Requirements**

**120 Credits Required**

**Departmental/Program Major Courses (53 credits)**

**Required Major Courses**
- ECON 25100 - Microeconomics Credits: 3.00 (satisfies General Education for College of Science core)
- ECON 25200 - Macroeconomics Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 37300 - Financial Mathematics Credits: 3.00 (students SHOULD earn a C or better)
- MGMT 20000 - Introductory Accounting Credits: 3.00
- MGMT 20100 - Management Accounting I Credits: 3.00
- MGMT 31000 - Financial Management Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- STAT 42000 - Introduction To Time Series Credits: 3.00
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00 (meets Teambuilding for College of Science Core)
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives Credits: 3.00
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00 (students SHOULD earn a C or better)
- STAT 47902 - Fundamental Short Term Actuarial Mathematics Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00 (students SHOULD earn a C or better)
- STAT 47501 - Advanced Long Term Actuarial Mathematics Credits: 3.00 or
- MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 -Advanced Short Term Actuarial Mathematics - Credit Hours: 3.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 Statistics For Risk Modeling II - Credit Hours: 3.00

Other Departmental/Program Course Requirements (37-58 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing (3-4 credits)**

- CNIT 17500 - Visual Programming **Credits**: 3.00 ♦ or
- CS 15900 - C Programming **Credits**: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects **Credits**: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits**: 4.00 ♦

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (6 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - fulfilled by ECON 25100 in major.
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits**: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I **Credits**: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits**: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits**: 4.00

**Science Technology and Society (1-3 credits)**

Choose one from the Science Technology and Society list here. (satisfies STS for core).
Statistics (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦

Team-Building and Collaboration

Fulfilled by STAT 47201 in major.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (9-30 credits)

Grade Requirements

- Students SHOULD strive to earn a "C" or better.

GPA Requirements

- 2.5 average GPA in Required Major Courses
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- A course can only be used once in the Major Course area.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan
Fall 1st Year

- ECON 25100 - Microeconomics Credits: 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core First-Year Composition - Credit hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 2.00 (MA 17000 or STAT 17000 strongly recommended)
- Elective - Credit Hours: 1.00 (MA 10800 or STAT 10100 strongly recommended)

16-19 Credits

Spring 1st Year

- MA 37300 - Financial Mathematics Credits: 3.00
- CNIT 17500 - Visual Programming Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 0-2.00

15-18 Credits

Fall 2nd Year

- ECON 25200 - Macroeconomics Credits: 3.00
- MGMT 20000 - Introductory Accounting Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00

16-17 Credits

Spring 2nd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MGMT 20100 - Management Accounting I Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- Elective (STAT 25000 Problem Solving In Probability recommended) - Credit Hours: 2.00-3.00
- Elective - Credit Hours: 0-1.00

15 Credits

Fall 3rd Year

- MGMT 31000 - Financial Management Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00

16-17 Credits

Spring 3rd Year

- STAT 42000 - Introduction To Time Series Credits: 3.00
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00
- STAT 47902 - Fundamental Short Term Actuarial Mathematics Credits: 3.00
- Elective (MGMT 41100 Recommended) - Credit Hours: 3.00

12 Credits

Fall 4th Year

- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00
- Statistics For Risk Modeling II - Credit Hours: 3.00
- STAT 47501 - Advanced Long Term Actuarial Mathematics Credits: 3.00
  or Elective - Credit Hours: 3.00
- Science Core: Great Issues In Science - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

12 Credits
Spring 4th Year

- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 Title: Advanced Short Term Actuarial Mathematics or Elective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 0.00-3.00

14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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
- Mathematics / Business
- Mathematics Teaching
- Mathematics with Computer Sciences
- Mathematics with Statistics

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

Applied Mathematics Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.
The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses

Required Major Courses (34 credits)

- CS 31400 - Numerical Methods Credits: 3.00
- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00 (students SHOULD earn a B- or better)
- MA 35301 - Linear Algebra II Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 42800 - Introduction To Fourier Analysis Credits: 3.00 or
- MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 44000 - Honors Real Analysis I Credits: 3.00
- MA 45000 - Algebra Honors Credits: 3.00 or
- MA 45300 - Elements Of Algebra I Credits: 3.00

Math/Statistics Selective (6 credits)

Course can only be used once to meet a major requirement.

- MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
- MA 37300 - Financial Mathematics Credits: 3.00
- MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
- MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
- MA 43200 - Elementary Stochastic Processes Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00 (Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.)
• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00 or
• STAT 51600 - Basic Probability And Applications Credits: 3.00

Other Departmental/Program Course Requirements (42-73 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^- Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (students SHOULD earn B- or better) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (students SHOULD earn B- or better)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list. (satisfies STS for core).

Statistics (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Courses (4-5 credits)

Calculus III Option

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

- should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.
Electives (13-44 credits)

Grade Requirements

- *Students should strive to earn a B- or better.*

GPA Requirements

- *Average GPA in courses must be 2.00 in Required Major Courses.*
- *2.0 Graduation GPA required for Bachelor of Science degree.*

Course Requirements

- A course can only be used once in the Major Course area.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Written Communication - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 1.00 (MA 10800 - Mathematics As A Profession And A Discipline strongly recommended)
- Electives - Credit Hours: 4.00

15-18 Credits

Spring 1st Year

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 3.00
• Electives - Credit Hours: 2.00

15-18 Credits

Fall 2nd Year

• MA 26100 - Multivariate Calculus Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00 (MA 30100 recommended)
• Elective - Credit Hours: 2.00

15-18 Credits

Spring 2nd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00 - 4.00

15-16 Credits

Fall 3rd Year

• CS 31400 - Numerical Methods Credits: 3.00
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

13-16 Credits
Spring 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00 - 3.00
- Elective - Credit Hours: 1.00 - 3.00

12-16 Credits

Fall 4th Year

- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 45300 - Elements Of Algebra I Credits: 3.00 or
- MA 45000 - Algebra Honors Credits: 3.00
- Math/Statistics Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 0.00-3.00
- Great Issues In Science Option - Credit Hours: 3.00

12-15 Credits

Spring 4th Year

- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences Credits: 3.00
- MA 42800 - Introduction To Fourier Analysis Credits: 3.00
  or
- MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
- Math/Statistics Selective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 2.00

12-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-
Critical Course

The course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Data Science, BS (Mathematics)

About the Program

Data science is one of the fastest-growing fields in the mathematical and computational sciences, with applications in almost every area of science, technology, and business. The Data Science track in Mathematics is designed to couple a foundation of mathematical training with the computational skills required to analyze large data sets to uncover and leverage predictive patterns and insights. Graduates will have learned to process and analyze continuous and discrete data, quantify uncertainty, construct hypotheses, design and validate models, and to explain these steps and put results in context. This major will open doors to Master's and Ph.D. programs in a variety of data-related fields and to a quickly-expanding range of careers in finance, industry, cybersecurity, medicine, and physical and social sciences.

Data Science (Mathematics) Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Degree Requirements

120 Credits Required

Data Science Major Courses (60-61 credits)

Must have a C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *(satisfies Computing, and Teambuilding and Collaboration, for College of Science core)*
- CS 18200 - Foundations Of Computer Science Credits: 3.00
- CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
- CS 38003 - Python Programming Credits: 1.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
- MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
- MA 43200 - Elementary Stochastic Processes Credits: 3.00
- STAT 35500 - Statistics For Data Science Credits: 3.00 *(satisfies Statistics for College of Science core)*
• STAT 41700 - Statistical Theory Credits: 3.00
• CS 24200 - Introduction To Data Science Credits: 3.00 or
• STAT 24200 - Introduction To Data Science Credits: 3.00
• CS 34800 - Information Systems Credits: 3.00 or
• MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00 or
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00 (CS37300 must be taken if planning to complete Capstone Requirement with CS49000 Data Science Capstone course; CS37300 must be taken if planning to take CS44000 Large Scale Data Analytics to complete CS Selective)
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00

Ethics Selective (3 credits)

Must have a C or better in all courses.

Choose 1.

• ILS 23000 - Data Science And Society: Ethical Legal Social Issues Credits: 3.00 (satisfies 3.0 credits of GE for College of Science core)
• PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00 (satisfies Science, Technology, and Society and 3.0 credits of GE for College of Science core)
• PHIL 20800 - Ethics Of Data Science Credits: 3.00 (must be 3.00 Credit Hour option; satisfies Science, Technology, and Society and 3.0 credits of GE for College of Science core)

MA Selective (3 credits)

Must have a C or better in all courses.

Choose 1.

• MA 42800 - Introduction To Fourier Analysis Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00

CS Selective (3 credits)

Must have a C or better in all courses.

Choose 1.

• CS 31400 - Numerical Methods Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 44000 - Large Scale Data Analytics Credits: 3.00
• CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 47500 - Human-Computer Interaction Credits: 3.00

Capstone (3 credits)
Students choosing a Zero-Credit Capstone Experience option must complete an additional selective from either the CS Selective or MA Selective course lists.

Must have a C or better in all courses.

Choose 1 option below.

Credit Course Options:
- MA 49000 - Topics In Mathematics For Undergraduates Credits: 1.00 to 6.00 -- (Approved Research Project In Data Science) - Credit Hours: 3.00
- MA 49000 -- Data Science Capstone - Credit Hours: 3.00
- STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00 -- (Approved Research Project In Data Science) - Credit Hours: 3.00
- STAT 49000 -- Data Science Capstone - Credit Hours: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00 - DSC-Data Science Capstone - Credit Hours: 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates (Approved Research Project in Data Science) - Credit Hours 3.00
- CS 43900 - Introduction To Data Visualization Credits: 3.00
- CS 30700 - Software Engineering I Credits: 3.00 - Project must be approved.
- CS 49700 - Honors Research Project Credits: 3.00 - Project must be approved.
- EPCS 41100 - Senior Design Participation In EPICS Credits: 1.00 and
- EPCS 41200 - Senior Design Participation In EPICS Credits: 2.00 - Project must be approved.

Zero-Credit Options:
- CS 38600 - Professional Practice IV Credits: 0.00 (must be approved in advance) or
- MA 38600 - Professional Practicum IV Credits: 0.00 (must be approved in advance) or
- STAT 39499 - Extensive Cooperative Experience IV Credits: 0.00
- CS 48700 - Professional Practice V Credits: 0.00 (must be approved in advance) or
- MA 48700 - Professional Practicum V Credits: 0.00 or 1.00 (must be approved in advance) or
- STAT 39599 - Extensive Cooperative Experience V Credits: 0.00
- CS 49000 Research Project in Data Science (Project must be approved) - Credit Hours: 0.00 or
- STAT 49000 Research Project in Data Science (Project must be approved) - Credit Hours: 0.00

Other Departmental/Program Course Requirements (29-49 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose 1 course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)
Students may elect to take 1 course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

**Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing**

*Met with required major coursework.*

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I *(Met with required major coursework)*
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose 1 from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below *(satisfies Science for core).*

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

*(satisfies Quantitative Reasoning for core)*

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits**: 5.00 (Must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I **Credits**: 4.00 (Must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have C or better to meet pre-requisite for STAT35500) or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have a C or better to meet pre-requisite for STAT35500)

Science Technology & Society (1-3 credits)

Choose 1 from the Science Technology and Society list here.

Statistics

Met with required major coursework.

Team-Building and Collaboration

Met with required major coursework.

Electives (10-31 credits)

CS19300 is strongly encouraged to be taken with CS18000. CS 19300 is not a degree requirement.

Grade Requirements

- *All courses required for the major, regardless of department, must be completed with a grade of "C" or better.
- *All prerequisites to CS, MA, and STAT courses required for the major, regardless of department, must be completed with a grade of "C" or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

Transfer Credit Policy
• Equivalent 10000 and 20000-level Mathematics (MA) transfer credit courses (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. Mathematics program.
• Equivalent 10000 and 20000-level Computer Science (CS) transfer credit courses (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. Mathematics program.
• CS and MA transfer credit at the 30000-40000-level may not be used to meet degree requirements. As exception to this policy is the application of pre-approved Study Abroad coursework.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 18000 - Problem Solving And Object-Oriented Programming</td>
<td>4.00</td>
</tr>
<tr>
<td>CS 19300 - Tools</td>
<td>1.00</td>
</tr>
<tr>
<td>MA 10800 - Mathematics As A Profession And A Discipline</td>
<td>1.00</td>
</tr>
<tr>
<td>MA 16100 - Plane Analytic Geometry And Calculus I</td>
<td>5.00 or</td>
</tr>
<tr>
<td>MA 16500 - Analytic Geometry And Calculus I</td>
<td>4.00</td>
</tr>
<tr>
<td>Science Core Selection - Credit Hours</td>
<td>3.00 - 4.00</td>
</tr>
<tr>
<td>Electives - Credit Hours</td>
<td>3.00</td>
</tr>
</tbody>
</table>

**16-18 Credits**

**Spring 1st Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 18200 - Foundations Of Computer Science</td>
<td>3.00</td>
</tr>
<tr>
<td>CS 38003 - Python Programming</td>
<td>1.00</td>
</tr>
<tr>
<td>MA 16200 - Plane Analytic Geometry And Calculus II</td>
<td>5.00 or</td>
</tr>
<tr>
<td>MA 16600 - Analytic Geometry And Calculus II</td>
<td>4.00</td>
</tr>
<tr>
<td>Science Core First-Year Composition Selection - Credit Hours</td>
<td>3.00 - 4.00</td>
</tr>
<tr>
<td>Science Core Selection - Credit Hours</td>
<td>3.00 - 4.00</td>
</tr>
<tr>
<td>Electives - Credit Hours</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**15-18 Credits**

**Fall 2nd Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 35500 - Statistics For Data Science</td>
<td>3.00</td>
</tr>
<tr>
<td>CS 24200 - Introduction To Data Science</td>
<td>3.00 or</td>
</tr>
<tr>
<td>STAT 24200 - Introduction To Data Science</td>
<td>3.00</td>
</tr>
<tr>
<td>MA 26100 - Multivariate Calculus</td>
<td>4.00 or</td>
</tr>
<tr>
<td>MA 27101 - Honors Multivariate Calculus</td>
<td>5.00</td>
</tr>
<tr>
<td>Science Core Selection - Credit Hours</td>
<td>3.00 - 4.00</td>
</tr>
<tr>
<td>Elective - Credit Hours</td>
<td>1.00 - 3.00</td>
</tr>
</tbody>
</table>

**14-18 Credits**

**Spring 2nd Year**
• CS 25300 - Data Structures And Algorithms For DS/Al \textbf{Credits:} 3.00
• MA 35100 - Elementary Linear Algebra \textbf{Credits:} 3.00
• MA 41600 - Probability \textbf{Credits:} 3.00 \textit{or}
• STAT 41600 - Probability \textbf{Credits:} 3.00
• Ethics Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 - 2.00

\textbf{16-18 Credits}

\textbf{Fall 3rd Year}

• COM 21700 - Science Writing And Presentation \textbf{Credits:} 3.00
• STAT 41700 - Statistical Theory \textbf{Credits:} 3.00
• CS 37300 - Data Mining And Machine Learning \textbf{Credits:} 3.00 \textit{or}
• MA 37400 - Mathematical Foundations For Machine Learning \textbf{Credits:} 3.00
• MA 34100 - Foundations Of Analysis \textbf{Credits:} 3.00 \textit{or}
• MA 44000 - Honors Real Analysis I \textbf{Credits:} 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

\textbf{15-16 Credits}

\textbf{Spring 3rd Year}

• MA 37500 - Introduction To Discrete Mathematics \textbf{Credits:} 3.00
• CS 34800 - Information Systems \textbf{Credits:} 3.00 \textit{or}
• MA 34900 - Signals And Systems For Mathematicians \textbf{Credits:} 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

\textbf{15-17 Credits}

\textbf{Fall 4th Year}
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• CS Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

16-17 Credits

Spring 4th Year

• Math Selective - Credit Hours: 3.00
• Capstone Experience/Course - Credit Hours: 0.00 - 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00

13-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Mathematics Education, BS**

**About the Program**

Math students enjoy a great deal of personal attention. Most math classes for math majors have 40 or fewer students, 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 a double major or a minor without too much difficulty. Math specializations include:

- Applied Mathematics
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Science
- Mathematics with Statistics

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.

This program meets state and national licensure standards and is accredited by the Council for the Accreditation of Education Preparation (CAEP) and the State of Indiana, State Board of Education. Admission to and successful completion of the Teacher Education Program (TEP) are required. [https://www.education.purdue.edu/licensure/](https://www.education.purdue.edu/licensure/)

**Mathematics Website**

**Mathematics Education Major Change (CODO) Requirements**

**Degree Requirements**

120 Credits Required

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses (87-91 credits)**

**Required Major Courses (43-47 credits)**

Average GPA in courses must be 2.50 or higher in Required Major Courses. (higher of grade between STAT 35000 and MA 48400 is used)

- MA 35100 - Elementary Linear Algebra **Credits:** 3.00 (student SHOULD earn a B- or better)
- MA 36600 - Ordinary Differential Equations **Credits:** 4.00
- MA 37500 - Introduction To Discrete Mathematics **Credits:** 3.00
- MA 46000 - Geometry **Credits:** 3.00
- MA 48400 - Seminar On Teaching College Algebra And Trigonometry **Credits:** 3.00
- STAT 31100 - Introductory Probability **Credits:** 3.00
- STAT 35000 - Introduction To Statistics **Credits:** 3.00♦
- MA 30100 - An Introduction To Proof Through Real Analysis **Credits:** 3.00♦ or
- MA 34100 - Foundations Of Analysis **Credits:** 3.00
- MA 45000 - Algebra Honors **Credits:** 3.00 or
- MA 45300 - Elements Of Algebra I **Credits:** 3.00
- CS 15900 - C Programming **Credits:** 3.00♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Calculus I Option

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (student SHOULD earn a B- or better) or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (student SHOULD earn a B- or better)

Calculus II Option

• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Calculus III Option

• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Professional Education Requirements (44 credits)

All required Major: Professional Education and optional Learner Specialty Pathway courses are calculated into the 2.5 Overall Teacher Education GPA requirement with no grade lower than a "C".

• EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
• EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00 ♦ (2 credits required)
• EDCI 22550 - Mathematics Education Seminar Credits: 1.00
• EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00 (1 credit required)
• EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00 ♦ (2 credits required)
• EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00 (1 credit required)
• EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00 (1 credit required)
• EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00 (2 credits required)
• EDCI 42500 - Teaching Of Secondary Mathematics - Methods I Credits: 3.00
• EDCI 42600 - Teaching Of Secondary Mathematics - Methods II Credits: 3.00
• EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00 (12 credits required)
• EDPS 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
• EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00 (2 credits required)
• EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
• EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
• EDPS 26501 - The Inclusive Classroom Credits: 2.00
• EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00 (1 credit required)
• EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00 (2 credits required)
• EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00 (2 credits required)
• EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00 (1 credit required)
Learner Pathway Selective (3 credits)

Choose one course from one of the learner pathway areas below. Students can elect to take additional coursework to complete a full concentration if they choose, but is not required. See the links for concentration requirements.

If you desire additional information regarding the Learner Pathway Concentrations, please reach out to your academic advisor or visit the Learner Specialty Concentrations tab found here.

**English Language Learners**
- EDCI 31950 - Approaches To English Learner Education Credits: 3.00
- EDCI 32650 - Introduction To Linguistics And Language Acquisition In Education Credits: 3.00  
  **High Ability** - All courses must be completed with a B- or better average.
- EDPS 54500 - Social And Affective Development Of Gifted Students Credits: 3.00
- EDPS 21100 - Special Education Law, Policy, And Ethical Guidelines Credits: 3.00
  **Applied Behavior Analysis**
- EDPS 34100 - Introduction To Philosophical Underpinnings And Concepts Of Applied Behavior Analysis Credits: 3.00
- EDPS 34200 - Applied Behavior Analysis - Assessment And Intervention Credits: 3.00

**Optional Concentration**

K-12 Integrated STEM Optional Concentration for Education

**Other Departmental/Program Course Requirements (24-48 credits)**

**COLLEGE OF SCIENCE CORE REQUIREMENTS**

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

**Composition & Presentation**

Written Communication

Met with EDCI 20500 in major.

**Technical Writing And Presentation** (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.
Computing

Met with required major coursework (CS 15900, CS 17600, CS 17700, CS 18000).

Cultural Diversity (Language & Culture)^* (0-6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I - met with EDCI 28500 in major
- Language & Culture Option II
- Language & Culture Option III

General Education^ (6 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I - met with EDPS 23500 in major.
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics

Met with required major coursework (MA 16100/16500 and MA 16200/16600).

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics

Met with required major coursework (STAT 35000).

Team-Building and Collaboration

Met with EDCI 49800 in major.
Electives (0-11 credits)

GPA Requirements

- 2.5 Graduation GPA required for Bachelor of Science degree.
- 2.5 Overall GPA is required for the Teacher Education Program.

Course Requirements and Notes

- A course can only be used once in the Major Course area.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

**Fall 1st Year**

- EDCI 20500 - Exploring Teaching As A Career Credits: 2.00 to 3.00
- EDST 20010 - Educational Policies And Laws Credits: 1.00 to 3.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection (Language & Culture) - Credit Hours: 4.00
- Elective (MA 10800 strongly recommended) - Credit Hours: 1.00
- Elective - Credit Hours: 3.00 - 4.00

15-17 Credits

**Spring 1st Year**

- EDCI 22550 - Mathematics Education Seminar Credits: 1.00
- EDCI 28500 - Multiculturalism And Education Credits: 2.00 to 3.00
- EDCI 35000 - Community Issues & Applications For Educators Credits: 1.00 to 3.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection (Technical Writing/Technical Presentation) - Credit Hours: 3.00 - 4.00
- Science Core Selection (General Education) - Credit Hours: 3.00 - 4.00
14-17 Credits

Fall 2nd Year

- EDCI 20002 - Special Populations Seminar: English Language Learners And Students With Gifts And Talents Credits: 1.00
- EDCI 37001 - Teaching And Learning English As A New Language Credits: 2.00 or 3.00
- EDPS 24000 - Children With Gifts, Creativity, And Talents Credits: 1.00
- EDPS 36201 - Positive Behavioral Supports Credits: 2.00 or 3.00
- MA 46000 - Geometry Credits: 3.00
- MA 26100 - Multivariate Calculus Credits: 4.00
- Science Core Selection (Science Laboratory) - Credit Hours: 3.00 - 4.00

16-18 Credits

Spring 2nd Year

- EDCI 20001 - Special Populations Seminar: Focus On Students With Disabilities And Differentiation Approaches Credits: 1.00
- EDPS 23500 - Learning And Motivation Credits: 2.00 or 3.00
- EDPS 24800 - Differentiating Curriculum And Instruction Credits: 1.00
- EDPS 26501 - The Inclusive Classroom Credits: 2.00
- MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
- STAT 31100 - Introductory Probability Credits: 3.00
- Science Core Selection (Laboratory Science) - Credit Hours: 3.00 - 4.00

15-16 Credits

Fall 3rd Year

- EDCI 27000 - Introduction To Educational Technology And Computing Credits: 1.00 to 3.00
- EDCI 30900 - Reading In Middle And Secondary Schools: Methods And Problems Credits: 1.00 to 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- CS 15900 - C Programming Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- MA 30100 - An Introduction To Proof Through Real Analysis Credits: 3.00 or
- MA 34100 - Foundations Of Analysis Credits: 3.00
- Learner Specialty Pathway Course - Credit Hours: 3.00
- Science Core Selection (Language & Culture) - Credit Hours: 3.00
17-18 Credits

Spring 3rd Year

- EDCI 42500 - Teaching Of Secondary Mathematics - Methods I Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- STAT 35000 - Introduction To Statistics Credits: 3.00
- Science Core Selection (Great Issues) - Credit Hours: 3.00
- Science Core Selection (General Education) - Credit Hours: 3.00

16 Credits

Fall 4th Year

- EDCI 42600 - Teaching Of Secondary Mathematics - Methods II Credits: 3.00
- EDPS 32700 - Classroom Assessment Credits: 1.00 to 3.00
- EDPS 43010 - Secondary Creating And Managing Learning Environments Credits: 1.00 to 3.00
- MA 48400 - Seminar On Teaching College Algebra And Trigonometry Credits: 3.00
- MA 45000 - Algebra Honors Credits: 3.00 or
- MA 45300 - Elements Of Algebra I Credits: 3.00
- Science, Technology, Society Course - Credit Hours: 3.00

15-16 Credits

Spring 4th Year

- EDCI 49800 - Supervised Teaching Credits: 8.00 to 16.00

12 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-
Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

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The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

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Mathematics Honors, BS

About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors have 40 or fewer students, 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 a double major or a minor without too much difficulty. Math specializations include:

- Applied Mathematics
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Science
- Mathematics with Statistics

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

Mathematics Major Change (CODO) Requirements  (Students must CODO to Mathematics before Mathematics Honors.)

Degree Requirements

120 Credits Required
Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses

Required Major Courses (31 credits)

Course can only be used once to meet a major requirement.
MA 35100 - Elementary Linear Algebra Credits: 3.00 (students SHOULD earn a B- or better)
MA 35301 - Linear Algebra II Credits: 3.00
MA 36600 - Ordinary Differential Equations Credits: 4.00
MA 42500 - Elements Of Complex Analysis Credits: 3.00
MA 42800 - Introduction To Fourier Analysis Credits: 3.00
MA 44000 - Honors Real Analysis I Credits: 3.00
MA 44200 - Honors Real Analysis II Credits: 3.00
MA 45000 - Algebra Honors Credits: 3.00

MA Selectives (6 credits)

Choose 6 credit hours.
Only one selective per group is allowed towards degree.
Course can only be used once to meet a major requirement.

Computer Science

Note: CS courses are space restricted. There is no guarantee of space availability in these courses for non-CS majors.

CS 24000 - Programming In C Credits: 3.00
CS 25100 - Data Structures And Algorithms Credits: 3.00
MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00

Discrete Mathematics, Foundations

CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
MA 38500 - Introduction To Logic Credits: 3.00

Numerical Analysis

CS 31400 - Numerical Methods Credits: 3.00
CS 51500 - Numerical Linear Algebra Credits: 3.00
CS 52000 - Computational Methods In Optimization Credits: 3.00
MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00

Statistics, Probability

MA 41600 - Probability Credits: 3.00
MA 43200 - Elementary Stochastic Processes Credits: 3.00
STAT 41600 - Probability Credits: 3.00
STAT 41700 - Statistical Theory Credits: 3.00
STAT 51600 - Basic Probability And Applications Credits: 3.00
STAT 51700 - Statistical Inference Credits: 3.00
STAT 51900 - Introduction To Probability Credits: 3.00

Advanced Topics Course
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course. The Mathematics Department will need to approve the category (Computer Science; Discrete Mathematics, Foundations; Numerical Analysis; Statistics, Probability) depending on course content. A course can only be used to meet one selective.

Algebra Selectives

• MA 45401 - Galois Theory Honors Credits: 3.00

Approved for MATH/MAED dual majors ONLY

The course is repeatable, but only allowed once for degree requirements.

• MA 48400 - Seminar On Teaching College Algebra And Trigonometry Credits: 3.00

Approved for MATH/PHYS dual majors ONLY

This option is a possibility for MATH/PHYS dual majors only. Students must meet qualifications per the Physics department to take these courses.

• PHYS 60000 - Methods Of Theoretical Physics I Credits: 3.00
• PHYS 60100 - Methods Of Theoretical Physics II Credits: 3.00

Other Departmental/Program Course Requirements (39-67 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing (3-4 credits)**

- CS 15900 - C Programming **Credits: 3.00** or
- CS 17600 - Data Engineering In Python **Credits: 3.00** or
- CS 17700 - Programming With Multimedia Objects **Credits: 4.00** or
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits: 4.00**

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits: 5.00** or (students SHOULD earn a B- or better)
- MA 16500 - Analytic Geometry And Calculus I **Credits: 4.00** (students SHOULD earn a B- or better)
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits: 5.00** or
- MA 16600 - Analytic Geometry And Calculus II **Credits: 4.00**

**Science Technology and Society (1-3 credits)**

Choose one from the Science Technology and Society list. (satisfies STS for core).
Statistics (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 35500 - Statistics For Data Science Credits: 3.00

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

- MA 26100 - Multivariate Calculus Credits: 4.00
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

- should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (22-50 credits)

Grade Requirements

- Student should strive to earn a B- or better.

GPA Requirements

- Average GPA in courses must be 3.50 or higher in Required Major Courses.
- Average GPA in MA 44000, MA 44200 and MA 45000 must be 3.50 or higher.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- A course can only be used once in the Major Course area.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 + or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 +
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (MA 10800 strongly recommended)
- Electives - Credit Hours: 4.00

15-18 Credits

Spring 1st Year

- CS 15900 - C Programming Credits: 3.00 # or
- CS 17600 - Data Engineering In Python Credits: 3.00 # or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 # or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 #
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 5.00

15-18 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 5.00 (MA 30100 recommended)
15-18 Credits

Spring 2nd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00 +
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Fall 3rd Year

- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 44000 - Honors Real Analysis I Credits: 3.00 (requires MA 35301 - students with calculus credit prior to beginning at Purdue may work with their advisor to alter their plan to meet pre-requisites for MA 44000 in Fall junior year. Students beginning in Calculus I first semester should plan to take MA 44000 in a later fall semester.)
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 2.00

15-17 Credits

Spring 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 • or
- STAT 35500 - Statistics For Data Science Credits: 3.00 •
- MA 42800 - Introduction To Fourier Analysis Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
15-16 Credits

Fall 4th Year

- MA 45000 - Algebra Honors Credits: 3.00
- MA Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Great Issues In Science Option - Credit Hours: 3.00

15-18 Credits

Spring 4th Year

- MA 44200 - Honors Real Analysis II Credits: 3.00
  (requires MA 35301)
- MA Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATIN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be..."
proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Mathematics, BS

About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors have 40 or fewer students, 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 a double major or a minor without too much difficulty. Math specializations include:

- Applied Mathematics
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Science
- Mathematics with Statistics

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

Mathematics Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:
Purdue Coursework

• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.

• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options.

College of Science degree programs vary widely in their approval and use of the preceding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

• Composition and Presentation
• Computing
• Cultural Diversity (Language and Culture)
• General Education
• Great Issues in Science
• Laboratory Science
• Mathematics
• Science Technology and Society
• Statistics
• Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses

Required Major Courses (28 credits)

Course can only be used once to meet a major requirement.

• MA 35100 - Elementary Linear Algebra Credits: 3.00
• MA 35301 - Linear Algebra II Credits: 3.00
• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 42500 - Elements Of Complex Analysis Credits: 3.00
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 45300 - Elements Of Algebra I Credits: 3.00 or
• MA 45000 - Algebra Honors Credits: 3.00

Math Selective (9 credits)
• Only one selective per group is allowed towards degree.
• Course can only be used once to meet a major requirement.

Algebra

• MA 45401 - Galois Theory Honors Credits: 3.00

Analysis

• MA 42800 - Introduction To Fourier Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00

Computer Science

Note: CS courses are space restricted. There is no guarantee of space availability in these courses for non-CS majors.

• CS 24000 - Programming In C Credits: 3.00
• CS 25100 - Data Structures And Algorithms Credits: 3.00
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• MA 34900 - Signals And Systems For Mathematicians Credits: 3.00

Discrete Mathematics, Foundations

• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
• MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
• MA 38500 - Introduction To Logic Credits: 3.00

Numerical Analysis

• CS 31400 - Numerical Methods Credits: 3.00
• CS 51500 - Numerical Linear Algebra Credits: 3.00
• CS 52000 - Computational Methods In Optimization Credits: 3.00
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00

Statistics, Probability

• MA 41600 - Probability Credits: 3.00
• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• STAT 41600 - Probability Credits: 3.00
• STAT 41700 - Statistical Theory Credits: 3.00
• STAT 51600 - Basic Probability And Applications Credits: 3.00
• STAT 51700 - Statistical Inference Credits: 3.00
• STAT 51900 - Introduction To Probability Credits: 3.00

Advanced Topics Course
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course. The Mathematics Department will need to approve the category (Computer Science; Discrete Mathematics, Foundations; Numerical Analysis, Statistics, Probability) depending on course content. A course can only be used to meet one selective.

Allowed for MATH/MAED dual majors ONLY

The course is repeatable, but only allowed once for degree requirements.

• MA 48400 - Seminar On Teaching College Algebra And Trigonometry Credits: 3.00

Allowed for MATH/PHYS dual majors ONLY

This option is a possibility for MATH/PHYS dual majors only. Students must meet qualifications per the Physics department to take these courses.

• PHYS 60000 - Methods Of Theoretical Physics I Credits: 3.00
• PHYS 60100 - Methods Of Theoretical Physics II Credits: 3.00

Other Departmental/Program Course Requirements (39-67 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement.

The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

**Science Technology and Society (1-3 credits)**

Choose one from the Science Technology and Society list here. (satisfies STS for core).

**Statistics (3 credits)**

- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

- should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (25-53 credits)

Grade Requirements

- Students should strive to earn a B- or better.

GPA Requirements

- Average GPA in courses must be 2.00 or higher in Required Major Courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- A course can only be used once in the Major Course area.
- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 + or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 +
- Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (MA 10800 strongly recommended)
• Elective - Credit Hours: 3.00 - 4.00

15-17 Credits

Spring 1st Year

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 5.00

15-18 Credits

Fall 2nd Year

• MA 26100 - Multivariate Calculus Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00 (MA 30100 recommended)
• Elective - Credit Hours: 2.00

15-18 Credits

Spring 2nd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 - 3.00
15 Credits

Fall 3rd Year

- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 44000 - Honors Real Analysis I Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 5.00

15-16 Credits

Spring 3rd Year

- MA 35301 - Linear Algebra II Credits: 3.00
- Math Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 6.00

15-16 Credits

Fall 4th Year

- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 45300 - Elements Of Algebra I Credits: 3.00 or
- MA 45000 - Algebra Honors Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Great Issues In Science Option - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 0.00 - 3.00

15-18 Credits

Spring 4th Year

- Math Selective - Credit Hours: 3.00
- Math Selective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.
World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Mathematics/Business, BS

About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors have 40 or fewer students, 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 a double major or a minor without too much difficulty. Math specializations include:

- Applied Mathematics
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Science
- Mathematics with Statistics

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

Mathematics/Business Major Change (CODO) Requirements

Degree Requirements
120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (40-43 credits)

Required Major Courses (25 credits)
Average GPA in courses must be 2.00 or higher in Required Major Courses.

- MA 35100 - Elementary Linear Algebra Credits: 3.00 (student SHOULD earn a B- or better)
- MA 35301 - Linear Algebra II Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 37300 - Financial Mathematics Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 44000 - Honors Real Analysis I Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- MA 43200 - Elementary Stochastic Processes Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- MA 43200 - Elementary Stochastic Processes Credits: 3.00 or
- STAT 41700 - Statistical Theory Credits: 3.00 or
- STAT 51700 - Statistical Inference Credits: 3.00

Minor Requirement (15-18 credits)

Students must earn a minor in ACCOUNTING, ECONOMICS, BUSINESS ECONOMICS, Finance, or MANAGEMENT to complete the major.

Other Departmental/Program Course Requirements (39-67 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)
• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (6-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I - May be met with required minor course (ECON 25100, ECON 25200, MGMT 20000, or MGMT 21200). If the Finance minor is chosen, then no General Education courses are met by minor.
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

• Laboratory Science Option I
• Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (student SHOULD earn a B- or better) or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics (3 credits)

• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00

Team-Building and Collaboration* (0-3 credits)
Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (10-41 credits)

Grade Requirements

• Students should strive to earn a B- or better.

GPA Requirements

• Average GPA in courses must be 2.00 or higher in Required Major Courses.
• 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

• A course can only be used once in the Major Course area.
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus | Credits: 5.00 + or
- MA 16500 - Analytic Geometry And Calculus | Credits: 4.00 +
- Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (MA 10800 strongly recommended)
• Electives - Credit Hours: 3.00 - 5.00

16-17 Credits

Spring 1st Year

• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 5.00

15 Credits

Fall 2nd Year

• MA 37300 - Financial Mathematics Credits: 3.00
• MA 26100 - Multivariate Calculus Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Minor Course Selection - Credit Hours: 3.00 - 4.00
• Elective Credit Hours: 0-2.00

15-16 Credits

Spring 2nd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
• Minor Course Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15 Credits
Fall 3rd Year

• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00 or
• STAT 51600 - Basic Probability And Applications Credits: 3.00
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

16-18 Credits

Spring 3rd Year

• MA 35301 - Linear Algebra II Credits: 3.00
• Minor Course Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 43200 - Elementary Stochastic Processes Credits: 3.00 or
• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00
• Minor Course Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Great Issues Option - Credit Hours: 3.00

16-17 Credits

Spring 4th Year

• STAT 51200 - Applied Regression Analysis Credits: 3.00
• Minor Course Selection - Credit Hours: 3.00
• Minor Course Selection or Elective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15 Credits

Pre-Requisite Information
World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Mathematics/Computer Science, BS

About the Program

Math students enjoy a great deal of personal attention. Most math classes for math majors have 40 or fewer students, 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 a double major or a minor without too much difficulty. Math specializations include:

- Applied Mathematics
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Science
- Mathematics with Statistics

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

Mathematics/Computer Science Major Change (CODO) Requirements
Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

• Major
• Science Core Curriculum
• Electives

Students may use any of the following options to meet College of Science degree requirements:

• Purdue Coursework
• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

• Composition and Presentation
• Computing
• Cultural Diversity (Language and Culture)
• General Education
• Great Issues in Science
• Laboratory Science
• Mathematics
• Science Technology and Society
• Statistics
• Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses
Required Major Courses (31 credits)

- CS 24000 - Programming In C Credits: 3.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00
- CS 31400 - Numerical Methods Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00 (student SHOULD earn a B- or better)
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- MA 37500 - Introduction To Discrete Mathematics Credits: 3.00

MACS Math Selective (6 credits)

Choose two. A course can only be used once to meet a major requirement.

- MA 35301 - Linear Algebra II Credits: 3.00
- MA 38500 - Introduction To Logic Credits: 3.00
- MA 45000 - Algebra Honors Credits: 3.00
- MA 45300 - Elements Of Algebra I Credits: 3.00
- MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course. The Mathematics Department will need to approve the category (MACS Math Selective, CS Selective, or MA/STAT Selective) depending on course content. A course can only be used to meet one selective.

CS Selective (3 credits)

Choose one. A course can only be used once to meet a major requirement.

- CS 33400 - Fundamentals Of Computer Graphics Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
- CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
- CS 51500 - Numerical Linear Algebra Credits: 3.00
- CS 52000 - Computational Methods In Optimization Credits: 3.00
- MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
- MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
- MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
- MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course. The Mathematics Department will need to approve the category (MACS Math Selective, CS Selective, or MA/STAT Selective) depending on course content. A course can only be used to meet one selective.

MA/STAT Selective (3 credits)

Choose one. A course can only be used once to meet a major requirement.

- MA 34100 - Foundations Of Analysis Credits: 3.00
- MA 44000 - Honors Real Analysis I Credits: 3.00
- MA 36200 - Topics In Vector Calculus Credits: 3.00
- MA 44200 - Honors Real Analysis II Credits: 3.00
- MA 45300 - Elements Of Algebra I Credits: 3.00
- MA 45000 - Algebra Honors Credits: 3.00
- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course. The Mathematics Department will need to approve the category (MACS Math Selective, CS Selective, or MA/STAT Selective) depending on course content. A course can only be used to meet one selective.
- STAT 42000 - Introduction To Time Series Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00

Other Departmental/Program Course Requirements (39-66 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (4 credits)

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (6-8 credits)**

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

**Mathematics (8-10 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 (student SHOULD earn a B- or better) or
- MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00 (student SHOULD earn a B- or better)
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00

**Science Technology and Society (1-3 credits)**

Choose one from the Science Technology and Society list here. (satisfies STS for core).

**Statistics (3 credits)**

- STAT 35000 - Introduction To Statistics **Credits:** 3.00 ♦ or
- STAT 35500 - Statistics For Data Science **Credits:** 3.00 ♦

**Team-Building and Collaboration* (0-3 credits)**

Choose one from this list.

**Required Pre-Requisite Course (4-5 Credits)**

*Calculus III Option*

- MA 26100 - Multivariate Calculus **Credits:** 4.00 or
- MA 27101 - Honors Multivariate Calculus **Credits:** 5.00
  
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.
Electives (23-50 credits)

Grade Requirements

• *Students should strive to earn a B- or better.*

GPA Requirements

• *Average GPA in courses must be 2.00 or higher in Required Major Courses.*
• *2.0 Graduation GPA required for Bachelor of Science degree.*

Course Requirements and Notes

• A course can only be used once in the Major Course area.
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 + or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 +
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (MA 10800 strongly recommended)
• Electives - Credit Hours: 4.00

15-18 Credits

Spring 1st Year
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 4.00

15-17 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 2.00

15-17 Credits

Spring 2nd Year

- MA 35100 - Elementary Linear Algebra Credits: 3.00 ±
- MA 37500 - Introduction To Discrete Mathematics Credits: 3.00 (used as CS 18200 pre-requisite)
- COM 21700 - Science Writing And Presentation Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- CS 24000 - Programming In C Credits: 3.00
- MA 36600 - Ordinary Differential Equations Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 3.00
- Electives - Credit Hours: 2.00

15-16 Credits

Spring 3rd Year
• CS 25100 - Data Structures And Algorithms Credits: 3.00
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 38500 - Introduction To Logic Credits: 3.00 or
• MA 45000 - Algebra Honors Credits: 3.00 or
• MA 45300 - Elements Of Algebra I Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year

• CS 31400 - Numerical Methods Credits: 3.00 or
• MA 51400 - Numerical Analysis Credits: 3.00
• MA 35301 - Linear Algebra II Credits: 3.00 or
• MA 38500 - Introduction To Logic Credits: 3.00 or
• MA 45000 - Algebra Honors Credits: 3.00 or
• MA 45300 - Elements Of Algebra I Credits: 3.00
• Great Issue Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

• MA/STAT Selective - Credit Hours: 3.00
• CS Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00 - 6.00

15-18 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPN-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

**Critical Course**

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

**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 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
- Mathematics / Business
- Mathematics
- Mathematics Teaching
- Mathematics with Computer Sciences
- Mathematics with Statistics

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

**Degree Requirements**

**120 Credits Required**

**Curriculum and Degree Requirements for College of Science**

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
Electives
Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (30-31 credits)

Required Major Courses (21 credits)

*The average GPA in courses must be 2.00 in Required Major Courses.*

*MA 37400 can only be used to meet one requirement in the Required Major Courses.*

*A course can only be used once to meet a major requirement.*

- MA 35100 - Elementary Linear Algebra Credits: 3.00 (student SHOULD earn a B- or better)
• MA 35301 - Linear Algebra II Credits: 3.00
• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• STAT 51200 - Applied Regression Analysis Credits: 3.00
• STAT 35000 - Introduction To Statistics Credits: 3.00 *(satisfies Statistics Requirement for College of Science Core) or
• STAT 35500 - Statistics For Data Science Credits: 3.00 *(satisfies Statistics Requirement for College of Science Core)
  - this course is only an option for students in Data Science majors.
• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00 or
• STAT 51600 - Basic Probability And Applications Credits: 3.00
• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00
• MA 34100 - Foundations Of Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
• MA 42500 - Elements Of Complex Analysis Credits: 3.00
• MA 42800 - Introduction To Fourier Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00
• MA 45000 - Algebra Honors Credits: 3.00
• MA 45300 - Elements Of Algebra I Credits: 3.00
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.

Advanced MA Selective (3-4 credits)

Choose one below.

A course can only be used once to meet a major requirement.

• MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
• MA 42500 - Elements Of Complex Analysis Credits: 3.00
• MA 42800 - Introduction To Fourier Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00
• MA 45000 - Algebra Honors Credits: 3.00
• MA 45300 - Elements Of Algebra I Credits: 3.00
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.

STAT Selective (3 credits)

Choose one below.

A course can only be used once to meet a major requirement.

• CS 37300 - Data Mining And Machine Learning Credits: 3.00 (Data Science, Computer Science, Computer Science
  Honors majors only)
• IE 53000 - Quality Control Credits: 3.00
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• STAT 42000 - Introduction To Time Series Credits: 3.00
• STAT 51300 - Statistical Quality Control Credits: 3.00
• STAT 51400 - Design Of Experiments Credits: 3.00
  One 3 credit combination of the TDM courses below can be used to meet ONE STAT Selective
• TDM 10100 - The Data Mine Seminar I Credits: 1.00
• TDM 10200 - The Data Mine Seminar II Credits: 1.00
• TDM 20100 - The Data Mine Seminar III Credits: 1.00
Other Departmental/Program Course Requirements (36-64 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

• Laboratory Science Option I
• Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (student SHOULD earn a B- or better) or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (student SHOULD earn a B- or better)
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics

Met with required major coursework (STAT 35000 or STAT 35500).

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option

• MA 26100 - Multivariate Calculus Credits: 4.00 or
MA 27101 - Honors Multivariate Calculus **Credits:** 5.00
- should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

**Electives (25-54 credits)**

**Grade Requirements**

- *Students should strive to earn a B- or better.*

**GPA Requirements**

- *Average GPA in courses must be 2.00 in Required Major Courses.*
- *2.0 Graduation GPA required for Bachelor of Science degree.*

**Course Requirements and Notes**

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- A course can only be used once to meet a major requirement.

**College of Science Pass/No Pass Option Policy**

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](https://www.provost.purdue.edu).
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 + or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 +
- Science Core - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 1.00 (MA 10800 strongly recommended)
- Electives - Credit Hours: 3.00-4.00

15-18 Credits

Spring 1st Year
• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 ♦ or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 3.00
• Electives - Credit Hours: 2.00

15-18 Credits

Fall 2nd Year

• MA 26100 - Multivariate Calculus Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 5.00 (MA 30100 recommended)

15-18 Credits

Spring 2nd Year

• COM 21700 - Science Writing And Presentation Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00 ♦
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
• STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
• Science Core Selection - Credit Hours: 3.00
• Electives - Credit Hours: 3.00

15 Credits

Fall 3rd Year

• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00 or
• STAT 51600 - Basic Probability And Applications Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 3.00
• Electives - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00
• MA 35301 - Linear Algebra II Credits: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• STAT 51200 - Applied Regression Analysis Credits: 3.00
• Great Issues Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective (STS course recommended) - Credit Hours: 3.00

15-16 Credits

Spring 4th Year

• Advanced MA Selective - Credit Hours: 3.00 - 4.00
• STAT Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00-4.00
• Science Core Selection - Credit Hours: 3.00-4.00
• Electives - Credit Hours: 3.00

15-17 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses
World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS-Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Minor

Mathematics Minor

The Mathematics Minor provides a strong background in mathematics for students majoring in some other discipline.

Requirements for the Minor (12-13 credits)

- Before undertaking this minor, the student must establish the prerequisites for the required minor courses.
- ALL COURSES REQUIRED FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY
- Transfer, AP, IB, and A LEVEL credit cannot be used for the minor.
- To qualify for the minor, courses must be completed with a C- or better (pass/no pass grade option is not allowed for the minor).
- The three courses used for Areas 2 and 3 cannot all be from the same group.

Area 1 - Choose One (3 credits)

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 26500 - Linear Algebra Credits: 3.00 (must be completed with a B- or better) *
- MA 35301 - Linear Algebra II Credits: 3.00 (recommended for students with TR or CR for MA 26500)

Area 2 - Choose One (3 credits)
The three courses used for Areas 2 and 3 cannot all be from the same group.

Algebra

- MA 45300 - Elements Of Algebra I Credits: 3.00
- MA 45000 - Algebra Honors Credits: 3.00

Analysis

- MA 34100 - Foundations Of Analysis Credits: 3.00
- MA 44000 - Honors Real Analysis I Credits: 3.00

Area 3 - Choose Two (6-7 credits)

The three courses used for Areas 2 and 3 cannot all be from the same group.

Algebra

- MA 45000 - Algebra Honors Credits: 3.00
- MA 45300 - Elements Of Algebra I Credits: 3.00

Analysis

- MA 30100 - An Introduction To Proof Through Real Analysis Credits: 3.00
- MA 34100 - Foundations Of Analysis Credits: 3.00
- MA 36200 - Topics In Vector Calculus Credits: 3.00
- MA 42500 - Elements Of Complex Analysis Credits: 3.00
- MA 42800 - Introduction To Fourier Analysis Credits: 3.00
- MA 44000 - Honors Real Analysis I Credits: 3.00
- MA 44200 - Honors Real Analysis II Credits: 3.00

Computer Science

- CS 24000 - Programming In C Credits: 3.00 or
- ECE 26400 - Advanced C Programming Credits: 3.00
- CS 25100 - Data Structures And Algorithms Credits: 3.00 or
- ECE 36800 - Data Structures Credits: 3.00

- MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
- MA 34900 - Signals And Systems For Mathematicians Credits: 3.00

Differential Equations

Only one differential equations course can be used in AREA 3.

- MA 36600 - Ordinary Differential Equations Credits: 4.00 or
- MA 26600 - Ordinary Differential Equations Credits: 3.00 (must be completed with a B- or better)** or
• MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences Credits: 3.00

Discrete Mathematics, Foundation

• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00
• CS 48300 - Introduction To The Theory Of Computation Credits: 3.00
• MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
• MA 38500 - Introduction To Logic Credits: 3.00

Linear Algebra

• MA 35301 - Linear Algebra II Credits: 3.00
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00

Numerical Analysis

• CS 31400 - Numerical Methods Credits: 3.00
• CS 514 - Numerical Analysis Credits: 3.00
• CS 51500 - Numerical Linear Algebra Credits: 3.00
• CS 52000 - Computational Methods In Optimization Credits: 3.00

Statistics, Probability

Only one statistics, probability course can be used in AREA 3.

• MA 41600 - Probability Credits: 3.00 or
• STAT 41600 - Probability Credits: 3.00 or
• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51600 - Basic Probability And Applications Credits: 3.00 or
• STAT 51900 - Introduction To Probability Credits: 3.00
• MA 43200 - Elementary Stochastic Processes Credits: 3.00

Notes

• No substitutions are allowed.
• A course can only be used in one area.
• *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 35301 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 can be used in Area 3). MA 26200 will not be accepted for the minor.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Disclaimer
The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

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**Non-Degree**

**Actuarial Science Major Change (CODO) Requirements**

Major Change (CODO) Requirements

Purdue students interested in changing their major should meet with their current academic advisor to discuss their options and begin the online process. Once the student's Major Change (CODO) has been processed, students will receive an email with instructions to authorize the change.

Students will need to meet the criteria below to be eligible for this major. A student's catalog term, typically the semester you started at Purdue, will be used to determine the Major Change criteria that applies to you. Students can find their catalog term at the top of their MyPurduePlan below the degree progress bar.

This major change information below is for the catalog term you are currently viewing; see the University Undergraduate Academic Advising Major Change (CODO) website for prior catalog term criteria, more about the major change process and FAQs.

Students changing their major to a space restricted program, as designated by SPACE AVAILABLE BASIS ONLY, need to have their Curricular Change Request (CCR) submitted by their home college/school by 5pm the Thursday of Finals week for requests effective the following term to be considered.

**Majors**

- **Actuarial Science, BS (ACSC)**
- **Actuarial Science Honors, BS (ASHO)** Students wishing to CODO to Actuarial Science Honors must first CODO to Actuarial Science.

**General Requirements**

- Minimum Semesters: 1
- Minimum Purdue Main Campus Credit Hours (West Lafayette/Indianapolis): 12
- Minimum Cumulative GPA: 2.0

**Course Requirements**

C or better in the following:

- MA 37300 - Financial Mathematics Credits: 3.00
- A two-course Calculus sequence. Course options include:
  - Calculus I
  - MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 or
- MA 16010 - Applied Calculus I Credits: 3.00 and MA 16020 - Applied Calculus II
  
  Calculus II
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
  
  Calculus III
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Other Requirements

- Students are accepted for effective terms FALL, SPRING, and SUMMER
- Major is open with no anticipated space restrictions.
- Students must be in good academic standing (not on academic notice)
- If a student has established credit [AP, IB, etc.] for Calculus 1, 2, and 3 (or beyond), then the student must have a C or better in the next math course in the Actuarial Science major AND a C or higher in MA 37300.
  2.5 or better in the following (if taken):
  - ECON 25100 Microeconomics
  - ECON 25200 Macroeconomics
  - MA 35100 Elementary Linear Algebra
  - MA 36600 Ordinary Differential Equations
  - MA 37300 Financial Mathematics
  - MA 41600 Probability
  - MA 49000 Topics In Mathematics For Undergraduates - Section: Actuarial Science Capstone - 3.00 credit hours
  - MA 49000 Topics In Mathematics For Undergraduates - Section: Advanced Short Term Actuarial Mathematics - 3.00 credit hours
  - MGMT 20000 Introductory Accounting
  - MGMT 20100 Management Accounting I
  - MGMT 31000 Financial Management
  - MGMT 41100 Investment Management
  - STAT 41600 Probability
  - STAT 41700 Statistical Theory
  - STAT 42000 Introduction To Time Series
  - STAT 47201 Fundamental Long Term Actuarial Mathematics
  - STAT 47301 Introduction To Arbitrage-Free Pricing Of Financial Derivatives
  - STAT 47401 Statistics For Risk Modeling I
  - STAT 47501 Advanced Long Term Actuarial Mathematics
  - STAT 47902 Fundamental Short Term Actuarial Mathematics
  - STAT 49000 Topics In Statistics For Undergraduates - Section: Actuarial Science Capstone - 3.00 credit hours
  - STAT 49000 Topics In Statistics For Undergraduates - Section: Statistics For Risk Modeling II - 3.00 credit hours
  - STAT 51600 Basic Probability And Applications

Advising Website

College of Science CODO Procedure and Advising

Student Next Steps

Students can speak with an advisor during Non Major Drop-in Hours.
Pre-Program

Data Science First Year (MA)

Data Science First Year

Program Requirements (25-28 credits)

Must have a C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 • * (satisfies Computing and Teambuilding for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 *
- CS 38003 - Python Programming Credits: 1.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 4.00

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 • *
- CS 19300 - Tools Credits: 1.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Electives - Credit Hours: 3.00

16-17 Credits

Spring 1st Year
• CS 18200 - Foundations Of Computer Science Credits: 3.00 *
• CS 38003 - Python Programming Credits: 1.00
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 or
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00
• Science Core First Year Composition Selection - Credit Hours: 3.00-4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00

14-17 Credits

Notes

• CS 19300 is a corequisite with CS 18000. CS19300 is not a degree requirement.
• *All CS, MA, and STAT courses required for the major, must be completed with a grade of "C" or better.
• All prerequisites to CS, MA, and STAT courses required for the major, regardless of department, must be completed with a grade of "C" or better.

- 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 60 faculty members, 22 postdocs and research scientists, 154 graduate students, and 231 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
Quantum Information Science

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 member of the national academy of engineering, 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.

All physics major students must complete the majority of upper level (300 level and above) physics courses in residence at Purdue. Students can use transfer credits for no more than 50 percent of the upper level physics courses in order to receive a Physics and Astronomy B.S. Degree.

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.

Department of Physics and Astronomy Website

Faculty

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

Graduate Information

For Graduate Information please see Physics and Astronomy Graduate Program Information.

Bachelor of Science

Applied Physics Honors, BS

About the Program
Purdue Physics and Astronomy is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors 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, nanophysics, 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.

24 credits of applied electives are usually courses chosen at the 300+ level of an applied area or courses that meet a minor in an applied area such as:

- Geophysics and Atmospheric Sciences
- Astrophysics
- Nuclear Physics
- Material Science & 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, planetary science, computer science and chemistry.

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.

Physics Website

Physics Major Change (CODO) Requirements (Students must CODO into Physics before Honors.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Applied Physics Honors Major Courses (68-70 credits)**

**Required Major Courses (44-46 credits)**

*Physics majors are required to take the Honors sections of PHYS 17200 in the fall and PHYS 27200 in the spring.*

- PHYS 17200 - Modern Mechanics **Credits:** 4.00 ♦ (satisfies SCI for core; satisfies Teambuilding for College of Science core)
- PHYS 27200 - Electric And Magnetic Interactions **Credits:** 4.00 ♦ (also satisfies SCI for core)
- PHYS 30600 - Mathematical Methods Of Physics I **Credits:** 3.00
- PHYS 30700 - Mathematical Methods Of Physics II **Credits:** 3.00
- PHYS 34000 - Modern Physics Laboratory **Credits:** 1.00
- PHYS 34400 - Introduction To Quantum Science **Credits:** 4.00
- PHYS 41000 - Physical Mechanics I Honors **Credits:** 3.00
- PHYS 41600 - Thermal And Statistical Physics Honors **Credits:** 4.00
- PHYS 42200 - Waves And Oscillations **Credits:** 3.00
- PHYS 43000 - Electricity And Magnetism I Honors **Credits:** 3.00
- PHYS 45000 - Intermediate Laboratory **Credits:** 2.00
• PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
• PHYS 59300 - Independent Research Credits: 1.00 to 4.00
  Calculus III Option - Select from:
  • MA 26100 - Multivariate Calculus Credits: 4.00 (satisfies Quantitative Reasoning for core) or
  • MA 27101 - Honors Multivariate Calculus Credits: 5.00 (satisfies Quantitative Reasoning for core)

Major Selective* - 24 credits

• Must be in chosen applied area(s) approved by the Physics and Astronomy Department
• Any >30000 level course taken for letter grade option (pass/no-pass option not approved) in the following course subjects:
  • AAE, ASTR, BIOL, CE, CHM, CS, EAPS, ECE, HSCI, ME, MSE, PHYS 32300, PHYS 32400, PHYS 39000, PHYS 49000, PHYS 59000.

Other Departmental/Program Course Requirements (38-56 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
  • *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
  • International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses could satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses could satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (8 credits)

(satisfies Science for core)

- CHM 11500 - General Chemistry Credits: 4.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 ♦

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science, Technology and Society^ (1-3 credits)

Choose one from this list (satisfies Science, Technology, Society for University core).

Statistics (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00

Team-Building and Collaboration

*Met with required major coursework (PHYS 17200) if taken at Purdue West Lafayette.*

Electives (0-14 credits)
Grade Requirements

- 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.
- ♦ Identified as a critical course. Students should earn minimum of a B- see advisor for further details.
- 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.
- All the core courses (PHYS 17200, PHYS 27200, PHYS 30600, PHYS 30700, PHYS 34400, PHYS 34000, and PHYS 42200) be complete with a B or better.

GPA Requirements

- 3.0 Graduation GPA required for Bachelor of Science degree.
- 3.0 average in PHYS/ASTR classes required to graduate.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Transfer Credits Policy towards the major: The majority of upper level (300 level and above) physics courses must be taken in residence at Purdue. Students can use transfer credits for no more than 50 percent of the upper level physics courses in order to receive a Physics and Astronomy B.S. Degree. Only free elective courses can be taken under the pass/non-pass grade option. Courses below are considered to have overlapping course content. Only one instance of an overlapping content course will apply toward graduate requirements. Courses listed in blocks are representative of the overlapping relationship.

Group 1

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 21800 - General Physics Credits: 4.00
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 17200H
- PHYS P2010
- PHYS 20100 (will add titles & links at publish)

Group 2

- PHYS 21900 - General Physics II Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
- PHYS P2020
- PHYS 27200H (will add titles & links at publish)

Group 3

- PHYS 31000 - Intermediate Mechanics Credits: 4.00
- PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
- PHYS 51000 - Physical Mechanics Credits: 3.00

Group 4

- PHYS 32200 - Intermediate Optics Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00

Group 5

- PHYS 34400 - Introduction To Quantum Science Credits: 4.00

Group 6

- PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
- PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
- PHYS 53000 - Electricity And Magnetism Credits: 3.00

Group 7

- PHYS 36000 - Quantum Mechanics Credits: 3.00
- PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
- PHYS 55000 - Introduction To Quantum Mechanics Credits: 3.00

Group 8

- PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
- PHYS 51500 - Thermal And Statistical Physics Credits: 3.00

Non-course / Non-credit Requirements

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

**College of Science Transfer Credit Policy**

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

**University Requirements**

**University Core Requirements**

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

**Civics Literacy Proficiency Requirement**

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency [website](#).

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

**Upper Level Requirement**

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill *most, if not all,* of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Additional Information

*Only one instance of an overlapping content course will apply towards graduation requirements. See here.*

Sample 4-Year Plan

Fall 1st Year

- CHM 11500 - General Chemistry **Credits:** 4.00 ♦
- PHYS 17200 - Modern Mechanics **Credits:** 4.00 ♦ (Honors sections)
- MA 16100 - Plane Analytic Geometry And Calculus I **Credits:** 5.00 or
- MA 16500 - Analytic Geometry And Calculus I **Credits:** 4.00
- Science Core Selection – Written Communication – Credit Hours: 3.00 – 4.00

15-17 Credits

Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions **Credits:** 4.00 ♦ (Honors sections)
- CHM 11600 - General Chemistry **Credits:** 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II **Credits:** 5.00 or
- MA 16600 - Analytic Geometry And Calculus II **Credits:** 4.00
- Science Core Selection - Credit Hours: 3.00

15-16 Credits

Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I **Credits:** 3.00
- PHYS 34000 - Modern Physics Laboratory **Credits:** 1.00
- PHYS 34400 - Introduction To Quantum Science **Credits:** 4.00
- MA 26100 - Multivariate Calculus **Credits:** 4.00 or
- MA 27101 - Honors Multivariate Calculus **Credits:** 5.00
- Science Core Selection - Credit Hours: 3.00

15-16 Credits

Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II **Credits:** 3.00
- PHYS 42200 - Waves And Oscillations **Credits:** 3.00
- CS 15900 - C Programming **Credits:** 3.00 or
- CS 17600 - Data Engineering In Python **Credits:** 3.00 or
- CS 17700 - Programming With Multimedia Objects **Credits:** 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming **Credits:** 4.00
- STAT 30100 - Elementary Statistical Methods **Credits:** 3.00 ♦ or
- STAT 35000 - Introduction To Statistics Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Fall 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
- Science Core Selection - Credit Hours: 3.00

14 Credits

Spring 3rd Year

- PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00

13-15 Credits

Fall 4th Year

- PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
- PHYS 59300 - Independent Research Credits: 1.00 to 4.00
  must be taken for 3.00 to 4.00 credit hours.
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Great Issues Option - Credit Hours: 3.00

16-17 Credits

Spring 4th Year

- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Science Core Selection - Credit Hours: 2.00

12-14 Credits
Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Applied Physics, BS

About the Program

Purdue Physics and Astronomy is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors 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, nanophysics, 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 applied electives under the applied physics curriculum can range from different areas. Individually tailored applied electives may be chosen by the student in consultation with an advisor. 24 credits of applied electives are usually courses chosen at the 300+ level of an applied area or courses that meet a minor in an applied area.

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, planetary sciences, computer science and chemistry.

Physics Website

Physics Major Change (CODO) Requirements (Students must CODO into Physics before Applied.)

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Applied Physics Major Courses (65 - 66 credits)

Required Major Courses (41-42 credits)

*Physics majors are required to take the Honors sections of PHYS 17200 and PHYS 27200.*

- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (satisfies Science for core; satisfies Teambuilding for College of Science core)
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (satisfies Science for core)
- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 31000 - Intermediate Mechanics Credits: 4.00
- PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- PHYS 36000 - Quantum Mechanics Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- PHYS 51500 - Thermal And Statistical Physics Credits: 3.00

Calculus III Option - Select from:
- MA 26100 - Multivariate Calculus Credits: 4.00 (satisfies Quantitative Reasoning for core) or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00 (satisfies Quantitative Reasoning for core)

Major Selective* - (24 credits)

- Any >30000 level course taken for letter grade option (pass/no-pass option not approved) in the following course subjects, as approved by the Physics and Astronomy Department:
- AAE, ASTR, BIOL, CE, CHM, CS, EAPS, ECE, HSCI, ME, MSE, NUCL, PHYS 32300, PHYS 32400, PHYS 39000, PHYS 49000, PHYS 59000

Other Departmental/Program Course Requirements (38-56 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation
Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0 or 3 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found [here](#). (satisfies OC for core)

- **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (8 credits)

(satisfies Science for core)

- CHM 11500 - General Chemistry Credits: 4.00 ♦
• CHM 11600 - General Chemistry Credits: 4.00 ♦

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society\(^*\) (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies STS for core).

Statistics (3 credits)

• STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ or
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦

Team-Building and Collaboration

*Met with required major coursework (PHYS 17200) if taken at Purdue West Lafayette.*

Electives (0-17 credits)

Grade Requirements

• ♦ Identified as a critical course. Students should earn minimum of a B- see advisor for further details

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree.
• 2.0 average in PHYS/ASTR classes required to graduate.

Course Requirements and Notes

• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
• Transfer Credits Policy towards the major: The majority of upper level (300 level and above) physics courses must be taken in residence at Purdue. Students can use transfer credits for no more than 50 percent of the upper level physics courses in order to receive a Physics and Astronomy B.S. Degree. Only free elective courses can be taken under the pass/non-pass grade option

Courses below are considered to have overlapping course content. Only one instance of an overlapping content course will apply toward graduate requirements. Courses listed in blocks are representative of the overlapping relationship.

Group 1
• PHYS 17200 - Modern Mechanics Credits: 4.00
• PHYS 21800 - General Physics Credits: 4.00
• PHYS 22000 - General Physics Credits: 4.00
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 17200H
• PHYS P2010
• PHYS 20100

Group 2

• PHYS 21900 - General Physics II Credits: 4.00
• PHYS 22100 - General Physics Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00
• PHYS 24100 - Electricity And Optics Credits: 3.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
• PHYS P2020
• PHYS 27200H

Group 3

• PHYS 31000 - Intermediate Mechanics Credits: 4.00
• PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
• PHYS 51000 - Physical Mechanics Credits: 3.00

Group 4

• PHYS 32200 - Intermediate Optics Credits: 3.00
• PHYS 42200 - Waves And Oscillations Credits: 3.00

Group 5

• PHYS 34400 - Introduction To Quantum Science Credits: 4.00

Group 6

• PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
• PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
• PHYS 53000 - Electricity And Magnetism Credits: 3.00

Group 7

• PHYS 36000 - Quantum Mechanics Credits: 3.00
• PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
• PHYS 55000 - Introduction To Quantum Mechanics Credits: 3.00

Group 8
Non-course / Non-credit Requirements

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

Only one instance of an overlapping content course will apply towards graduation requirements. See here.

Sample 4-Year Plan

Fall 1st Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (Honors sections)
- CHM 11500 - General Chemistry Credits: 4.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection – Written Communication – Credit Hours: 3.00 – 4.00

15-17 Credits

Spring 1st Year

- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (Honors sections)
- CHM 11600 - General Chemistry Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits
Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- CS 15900 - C Programming Credits: 3.00 or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- Science Core Selection - Credit Hours: 3.00

15-16 Credits

Fall 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- PHYS 31000 - Intermediate Mechanics Credits: 4.00
- PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Spring 3rd Year

- PHYS 36000 - Quantum Mechanics Credits: 3.00
- PHYS 51500 - Thermal And Statistical Physics Credits: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

15 Credits
Fall 4th Year

- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Great Issues Option - Credit Hours: 3.00

12 Credits

Spring 4th Year

- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Major Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Electives - Credit Hours: 3.00

13-15 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.
Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Physics Honors, BS

About the Program

Purdue Physics and Astronomy is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors 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, nanophysics, 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 59300 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 17200 and PHYS 27200 as freshmen. Students from other majors who have taken PHYS 17200/PHYS 27200 may switch into the Honors Physics major. Admission to, and continuation in, the honors program requires that all the core courses (PHYS 17200, PHYS 27200, PHYS 30600, PHYS 30700, PHYS 34400, PHYS 34000, and PHYS 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, PHYS 27200, PHYS 30600, PHYS 30700, PHYS 34400, PHYS 34000, and PHYS 42200) be complete with a B or better.

Physics Major Change (CODO) Requirements (Students must CODO into Physics before moving into Physics Honors.)

Degree Requirements
120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Physics Honors Major Courses (66-68 credits)

Required Major Courses (51-52 credits)
- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (Physics majors are required to take the honors sections; satisfies Science for core; satisfies Teambuilding Experience for College of Science core)
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (Physics majors are required to take the honors sections; also satisfies Science for core)
- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
- PHYS 41100 - Physical Mechanics II Honors Credits: 2.00
- PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
- PHYS 43100 - Electricity And Magnetism II Honors Credits: 2.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
- PHYS 46100 - Quantum Mechanics II Honors Credits: 3.00
- PHYS 59300 - Independent Research Credits: 1.00 to 4.00

Calculus III Options - Credit Hours: 4-5
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00

Major Selective* (15-16 credits)

Advanced Lab Options
- PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
- PHYS 58000 - Computational Physics Credits: 3.00
- PHYS/ASTR Selective ≥ 500 level - Credit Hours: 3.00
- PHYS/ASTR Selective ≥ 500 level - Credit Hours: 3.00
- Science/Engineering Selective ≥ 300 level (could be met by Statistics for College of Science core) - Credit Hours: 3.00
- Science/Engineering Selective ≥ 300 level (could be met by Statistics for College of Science core) - Credit Hours: 3.00

Other Departmental/Program Course Requirements (38-62 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)
Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- **Special Note:** Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

**Computing (3-4 credits)**

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

**Cultural Diversity (Language & Culture)^* (0-9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

**General Education^ (9 credits)**

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

**Great Issues In Science (3 credits)**

Choose one from this list.

**Laboratory Science (8 credits)**

(satisfies Science for core)

- CHM 11500 - General Chemistry Credits: 4.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 ♦

**Mathematics (8-10 credits)**

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society\(^*\) (1-3 credits)

Choose one from the Science Technology and Society list here (satisfies STS for core).

Statistics (3 credits)

- STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ or
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦

Team-Building and Collaboration

*Met with required major coursework (PHYS 17200) if taken at Purdue West Lafayette.*

Electives (0-16 credits)

Grade Requirements

- 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.
- ♦ Identified as a critical course. Students should earn minimum of a B- see advisor for further details
- 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.
- All the core courses (PHYS 17200, PHYS 27200, PHYS 30600, PHYS 30700, PHYS 34400, PHYS 34000, and PHYS 42200) be complete with a B or better.

GPA Requirements

- Both the physics AND overall GPAs of 3.0 or better are required for a student to graduate with Honor.
- 3.0 Graduation GPA required for Bachelor of Science degree.
- 3.0 average in PHYS/ASTR classes required to graduate.

Course Requirements and Notes

- Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
- Transfer Credits Policy towards the major: The majority of upper level (300 level and above) physics courses must be taken in residence at Purdue. Students can use transfer credits for no more than 50 percent of the upper level physics courses in order to receive a Physics and Astronomy B.S. Degree. Only free elective courses can be taken under the pass/non-pass grade option.
- Courses below are considered duplicate content. Only one instance of an overlapping content course will apply toward graduate requirements. Courses listed in blocks are representative of the overlapping relationship.

Group 1

- PHYS 17200 - Modern Mechanics Credits: 4.00
- PHYS 21800 - General Physics Credits: 4.00
- PHYS 22000 - General Physics Credits: 4.00
- PHYS 23300 - Physics For Life Sciences I Credits: 4.00
- PHYS 17200H
- PHYS P2010
- PHYS 20100

**Group 2**

- PHYS 21900 - General Physics II Credits: 4.00
- PHYS 22100 - General Physics Credits: 4.00
- PHYS 23400 - Physics For Life Sciences II Credits: 4.00
- PHYS 24100 - Electricity And Optics Credits: 3.00
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
- PHYS P2020
- PHYS 27200H

**Group 3**

- PHYS 31000 - Intermediate Mechanics Credits: 4.00
- PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
- PHYS 51000 - Physical Mechanics Credits: 3.00

**Group 4**

- PHYS 32200 - Intermediate Optics Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00

**Group 5**

- PHYS 34400 - Introduction To Quantum Science Credits: 4.00

**Group 6**

- PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
- PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
- PHYS 53000 - Electricity And Magnetism Credits: 3.00

**Group 7**

- PHYS 36000 - Quantum Mechanics Credits: 3.00
- PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
- PHYS 55000 - Introduction To Quantum Mechanics Credits: 3.00

**Group 8**

- PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
• PHYS 51500 - Thermal And Statistical Physics Credits: 3.00

Non-course / Non-credit Requirements

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

(http://www.science.purdue.edu/Current_Students/curriculum_and_degree_requirements/earning-requirements-through-experience.html)

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Additional Information

Only one instance of an overlapping content course will apply towards graduation requirements. See: https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/Overlap-Courses.pdf

Sample 4-Year Plan

Fall 1st Year

- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (Honors sections)
- CHM 11500 - General Chemistry Credits: 4.00 ♦
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection – Written Communication – Credit Hours: 3.00 – 4.00

15-17 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 ♦
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (Honors sections)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
15-17 Credits

Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 or
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- CS 15900 - C Programming Credits: 3.00 or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
- Science/Engineering Selective > 300 - Credit Hours: 3.00

15-16 Credits

Fall 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- PHYS 46000 - Quantum Mechanics I Honors Credits: 3.00
- Science Core Selection - Credit Hours: 3.00-4.00

14-15 Credits

Spring 3rd Year

- PHYS 41100 - Physical Mechanics II Honors Credits: 2.00
- PHYS 43000 - Electricity And Magnetism I Honors Credits: 3.00
- PHYS 46100 - Quantum Mechanics II Honors Credits: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00

14 Credits
Fall 4th Year

- PHYS 41600 - Thermal And Statistical Physics Honors Credits: 4.00
- PHYS 43100 - Electricity And Magnetism II Honors Credits: 2.00
- PHYS 59300 - Independent Research Credits: 1.00 to 4.00
  must be taken for at least 3 credits to meet degree requirements.
- Science/Engineering Selective ≥ 300 - Credit Hours: 3.00
- Great Issues Option - Credit Hours: 3.00

15 Credits

Spring 4th Year

- PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
- PHYS 58000 - Computational Physics Credits: 3.00
- PHYS/ASTR Selective ≥ 500 - Credit Hours: 3.00
- PHYS/ASTR Selective ≥ 500 - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Science Core Selection - Credit Hours: 3.00

13-16 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer
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Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Physics, BS

About the Program

Purdue Physics and Astronomy is an internationally recognized department for excellence in forefront research and undergraduate and graduate education. Our undergraduate classes for physics majors 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 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, PHYS 49000, or PHYS 59000).

Opportunities for employment in fields related to physics will also be enhanced by taking 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

Physics Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science
A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Physics Major Courses (53-55 credits)**

**Required Major Courses (41-42 credits)**

- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (Physics majors required to take honors sections; satisfies Science for core; satisfies Teambuilding for College of Science core)
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (Physics majors required to take honors sections; satisfies Science for core)
- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 31000 - Intermediate Mechanics Credits: 4.00
- PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- PHYS 36000 - Quantum Mechanics Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- PHYS 45000 - Intermediate Laboratory Credits: 2.00
- PHYS 51500 - Thermal And Statistical Physics Credits: 3.00

Calculus III Option - Credit Hours: 4-5
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00 (satisfies Quantitative Reasoning for core)

Major Selective* (12-13 credits)

Advanced Lab Option
- PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
- PHYS 58000 - Computational Physics Credits: 3.00
- PHYS/ASTR ≥ 300 level - Credit Hours: 3.00
- Science/Engineering Elective ≥ 300 level (could be met by Statistics for College of Science core) - Credit Hours: 3.00
- Science/Engineering Elective ≥ 300 level (could be met by Great Issues for College of Science core) - Credit Hours: 3.00

Other Departmental/Program Course Requirements (38-62 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.
Computing (3-4 credits)

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (8 credits)

(satisfies Science for core)

- CHM 11500 - General Chemistry Credits: 4.00 ♦
- CHM 11600 - General Chemistry Credits: 4.00 ♦

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society^* (1-3 credits)

Choose one from this list (select courses COULD satisfy Science, Technology, Society for core).

Statistics (3 credits)
• STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ or
• STAT 35000 - Introduction To Statistics Credits: 3.00 ♦

Team-Building and Collaboration* (0-3 credits)

*Met with required major coursework (PHYS 17200) if taken at Purdue West Lafayette.

Electives (3-29 credits)

GPA Requirements

• 2.0 Graduation GPA required for Bachelor of Science degree.
• 2.0 average in PHYS/ASTR classes required to graduate.

Course Requirements and Notes

• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.
• Transfer Credits Policy towards the major: The majority of upper level (300 level and above) physics courses must be taken in residence at Purdue. Students can use transfer credits for no more than 50 percent of the upper level physics courses in order to receive a Physics and Astronomy B.S. Degree. Only free elective courses can be taken under the pass/non-pass grade option. Courses below are considered to have overlapping course content. Only one instance of an overlapping content course will apply toward graduate requirements. Courses listed in blocks are representative of the overlapping relationship.

Group 1

• PHYS 17200 - Modern Mechanics Credits: 4.00
• PHYS 21800 - General Physics Credits: 4.00
• PHYS 22000 - General Physics Credits: 4.00
• PHYS 23300 - Physics For Life Sciences I Credits: 4.00
• PHYS 17200H
• PHYS P2010
• PHYS 20100 (will add titles & links at publish)

Group 2

• PHYS 21900 - General Physics II Credits: 4.00
• PHYS 22100 - General Physics Credits: 4.00
• PHYS 23400 - Physics For Life Sciences II Credits: 4.00
• PHYS 24100 - Electricity And Optics Credits: 3.00
• PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00
• PHYS P2020
• PHYS 27200(H) (will add titles & links at publish)

Group 3

• PHYS 31000 - Intermediate Mechanics Credits: 4.00
• PHYS 41000 - Physical Mechanics I Honors Credits: 3.00
Group 4

- PHYS 32200 - Intermediate Optics **Credits:** 3.00
- PHYS 42200 - Waves And Oscillations **Credits:** 3.00

Group 5

- PHYS 34400 - Introduction To Quantum Science **Credits:** 4.00

Group 6

- PHYS 33000 - Intermediate Electricity And Magnetism **Credits:** 3.00
- PHYS 43000 - Electricity And Magnetism I Honors **Credits:** 3.00
- PHYS 53000 - Electricity And Magnetism **Credits:** 3.00

Group 7

- PHYS 36000 - Quantum Mechanics **Credits:** 3.00
- PHYS 46000 - Quantum Mechanics I Honors **Credits:** 3.00
- PHYS 55000 - Introduction To Quantum Mechanics **Credits:** 3.00

Group 8

- PHYS 41600 - Thermal And Statistical Physics Honors **Credits:** 4.00
- PHYS 51500 - Thermal And Statistical Physics **Credits:** 3.00

**Non-course / Non-credit Requirements**

Earning Core Curricular Requirements through Experience

*Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.*

**College of Science Pass/No Pass Option Policy**

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.
Additional Information

Only one instance of an overlapping content course will apply towards graduation requirements. See: https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/Overlap-Courses.pdf

Sample 4-Year Plan

Fall 1st Year

- CHM 11500 - General Chemistry Credits: 4.00 ♦
- PHYS 17200 - Modern Mechanics Credits: 4.00 ♦ (Honors sections)
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection – Written Communication – Credit Hours: 3.00 – 4.00

15-17 Credits

Spring 1st Year

- CHM 11600 - General Chemistry Credits: 4.00 ♦
- PHYS 27200 - Electric And Magnetic Interactions Credits: 4.00 ♦ (Honors sections)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Fall 2nd Year

- PHYS 30600 - Mathematical Methods Of Physics I Credits: 3.00
- PHYS 34000 - Modern Physics Laboratory Credits: 1.00
- PHYS 34400 - Introduction To Quantum Science Credits: 4.00
- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Spring 2nd Year

- PHYS 30700 - Mathematical Methods Of Physics II Credits: 3.00
- PHYS 42200 - Waves And Oscillations Credits: 3.00
- STAT 30100 - Elementary Statistical Methods Credits: 3.00 ♦ or
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦
- CS 15900 - C Programming Credits: 3.00 or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00

15-17 Credits

Fall 3rd Year

• PHYS 31000 - Intermediate Mechanics Credits: 4.00
• PHYS 33000 - Intermediate Electricity And Magnetism Credits: 3.00
• PHYS 45000 - Intermediate Laboratory Credits: 2.00
• COM 21700 - Science Writing And Presentation Credits: 3.00
• Science Core Selection - Credit Hours: 3.00

15 Credits

Spring 3rd Year

• PHYS 36000 - Quantum Mechanics Credits: 3.00
• PHYS 51500 - Thermal And Statistical Physics Credits: 3.00
• Science Core Selection* - Credit Hours: 3.00
• Elective - Credit Hours: 1.00-4.00
• Elective - Credit Hours: 2.00-4.00

12-17 Credits

Fall 4th Year

• PHYS/ASTR Selective ≥ 300 level - Credit Hours: 3.00
• Science/Engineering Selective ≥ 300 - Credit Hours: 3.00
• Great Issues In Science Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 0.00-4.00

12-16 Credits

Spring 4th Year

• PHYS 53600 - Electronic Techniques For Research Credits: 4.00 or
• PHYS 58000 - Computational Physics Credits: 3.00
• Science/Engineering Selective ≥ 300 - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Electives - Credit Hours: 0.00-3.00
• Electives - Credit Hours: 0.00-5.00

12-13 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Minor

Astronomy Minor

Requirements for the Minor (15-16 credits)

Before undertaking this minor, the student must establish the prerequisites for the required minor courses.

• MA 16100 or MA 16500
• MA 16200 or MA 16600
• PHYS 17200
• PHYS 27200 or PHYS 24100
• PHYS 34200 or PHYS 34400 are required for all PHYS/ASTR 500+ courses

Required Courses (12-13 credits)

• ASTR 36300 - The Solar System Credits: 3.00
• ASTR 36400 - Stars And Galaxies Credits: 3.00
• ASTR 37000 - Cosmology Credits: 3.00
• PHYS 34202 - Introduction To Quantum Science Credits: 3.00 restricted to PHYS non-majors or
• PHYS 34400 - Introduction To Quantum Science Credits: 4.00 restricted to PHYS majors

Additional Course - (3 credits)

Choose one.

• ASTR 56000 - Stellar Evolution Credits: 3.00
• PHYS 56000 - Stellar Evolution Credits: 3.00
• ASTR 56100 - Galaxies And Large Scale Structure Credits: 3.00
• PHYS 56100 - Galaxies And Large Scale Structure Credits: 3.00
• ASTR 56200 - Introduction To High Energy Astrophysics Credits: 3.00
• PHYS 56200 - Introduction To High Energy Astrophysics Credits: 3.00
• ASTR 56300 - Astroparticle Physics Credits: 3.00
• PHYS 56300 - Astroparticle Physics Credits: 3.00
• ASTR 56700 - Observational Techniques In Astronomy Credits: 3.00
• PHYS 56700 - Observational Techniques In Astronomy Credits: 3.00
• PHYS/ASTR - Approved 40000- level or above - Credit Hours: 3.00

Notes

• A student must receive a GPA of 2.0 or higher in required minor courses.
• 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.
• No course may be taken pass/fail.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.
**Physics Minor**

**Requirements for the Minor (10 credits)**

Before undertaking this minor, the student must establish the prerequisites for the required minor courses.

- Least amount of prerequisites required:
  - Math: MA 16100 (16500) MA 16200(16600)
  - Physics: PHYS 17200, 27200 (24100)
  - PHYS 30000-level or above: Check prerequisites for each course.

**Required Courses (4 credits)**

- PHYS 34000 - Modern Physics Laboratory **Credits:** 1.00
  - AND
- PHYS 34202 - Introduction To Quantum Science **Credits:** 3.00

**Physics and Astronomy courses 30000-level or above (6 credits)**

- PHYS 30000-59999
- ASTR 50000-59999
- (Except PHYS 31700, PHYS 32300, PHYS 32400, PHYS 39000, PHYS 49000, PHYS 59000, or PHYS 59300)

**Notes**

- A student must receive a GPA of 2.0 or higher in required minor courses.
- 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
- No course may be taken pass/fail.

**Pre-Requisite Information**

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

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The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
Department of Statistics

Overview

Purdue University's Department of Statistics is one of the first dedicated Statistics programs in the country. From its inception as a Statistical Laboratory in 1947, it has been a prominent center of statistical research and has grown to become one of the largest Statistics departments in the United States. By pursuing foundational research in probability, statistical theory and methodology, and computational statistics, combined with interdisciplinary research in statistical genetics and bioinformatics, machine learning, computational finance, industrial Statistics, and other fields across Purdue University's campus, the Department of Statistics continues the proud tradition of making fundamental contributions to science while developing new methodologies, theories, and algorithms for statistics and machine learning. It has been a consistently top-ranked department among Statistics departments in the United States. In a world where data are being generated faster than they can be analyzed, the Department of Statistics promotes the design of meaningful experiments, observational studies, and surveys for data collection, the development of analysis and modeling methodologies for performing rigorous and valid inferences from the collected data, as well as the computational algorithms necessary to perform rigorous and valid inferences from the collected data and informed decision making based on the results of data analyses.

Housed in both Haas Hall and the Mathematical Sciences Building, the department's diverse faculty work to advance the frontiers of statistical science and data science in both theory and applications. They seek to provide learning environments that produce well-educated data scientists, statisticians, probabilists, and quantitatively literate people. They have a long history of providing cutting-edge learning environments conducive to successful and impactful graduates: https://www.stat.purdue.edu/alumni/profiles/index.html. Through their interdisciplinary partnerships, the faculty, staff, and students of the department bring the strengths of the statistical sciences to address significant societal needs.

The department offers an undergraduate degree in Statistics, allowing students to focus on either Applied Statistics or Mathematical Statistics. Partnership with the Department of Mathematics also provides the opportunity to major in Actuarial Science, while a collaboration with the Department of Computer Science enables undergraduates to pursue a Data Science major. Undergraduates from a range of disciplines can minor in Statistics as well. Graduate students have access to an array of certificate, MS, and PhD programs with distinct concentrations and collaborative opportunities.

As of March 2021, there are 36 tenured and tenure-track professors, 5 emeriti faculty, 12 adjunct and courtesy faculty members, 5 visiting professors, and 16 lecturers who form the Department of Statistics faculty. The department has approximately 538 undergraduate students majoring in Statistics and/or Actuarial Science (a joint major with the Department of Statistics), and 410 student have the major Data Science. The department has 173 graduate students, 95 are Ph.D. students and 78 are M.S. students.

Department of Statistics Website

Faculty

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: Hao Zhang zhanghao@purdue.edu
Graduate Information

For Graduate Information please see Statistics Graduate Program Information.

Bachelor of Science

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

Applied Statistics Major Change (CODO) Requirements

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.
Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

**College of Science Core Requirements**

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

**Earning Core Curricular Requirements through Experience**

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

**Departmental/Program Major Courses (24-25 credits)**

**Required Major Courses (18 credits)**

*The average GPA in courses must be 2.00 in Required Major Courses. STAT42000 can only be used to meet one requirement in the Required Major Courses.*

Course can only be used once to meet a major requirement.

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00 or
- STAT 47401 - Statistics For Risk Modeling I Credits: 3.00 - only allowed if student is a dual major in Actuarial Science or Actuarial Science Honors major.
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ (satisfies Statistics requirement for College of Science core) or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦ - this course is only an option for students in Data Science majors.
- MA 36200 - Topics In Vector Calculus Credits: 3.00 or
- STAT 42000 - Introduction To Time Series Credits: 3.00
- MA 41600 - Probability Credits: 3.00 ♦ or
- STAT 41600 - Probability Credits: 3.00 ♦ or
- STAT 51600 - Basic Probability And Applications Credits: 3.00 ♦
- STAT 41700 - Statistical Theory Credits: 3.00 or
- STAT 51700 - Statistical Inference Credits: 3.00
Applied Statistics Selective (6-7 credits)

Choose 2 courses from the list below. (Check with advisor for additional approved courses.) STAT42000 can only be used to meet one requirement in the major.

Course can only be used once to meet a major requirement.

- STAT 51300 - Statistical Quality Control Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
- STAT 42000 - Introduction To Time Series Credits: 3.00
- STAT 47201 - Fundamental Long Term Actuarial Mathematics Credits: 4.00
- STAT 47301 - Introduction To Arbitrage-Free Pricing Of Financial Derivatives Credits: 3.00
- STAT 50600 - Statistical Programming And Data Management Credits: 3.00
- STAT 52200 - Sampling And Survey Techniques Credits: 3.00

One 3 credit combination of the TDM courses below can be used to meet ONE STAT Selective

- TDM 10100 - The Data Mine Seminar I Credits: 1.00
- TDM 10200 - The Data Mine Seminar II Credits: 1.00
- TDM 20100 - The Data Mine Seminar III Credits: 1.00
- TDM 20200 - The Data Mine Seminar IV Credits: 1.00
- TDM 30100 - The Data Mine Seminar V Credits: 1.00
- TDM 30200 - The Data Mine Seminar VI Credits: 1.00
- TDM 40100 - The Data Mine Seminar VII Credits: 1.00
- TDM 40200 - The Data Mine Seminar VIII Credits: 1.00

Other Departmental/Program Course Requirements (36-64 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

- Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
- *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
- International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.
Computing (3-4 credits)

- CS 15900 - C Programming Credits: 3.00 or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society Requirement (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics
Met with required major coursework: STAT 35000 or STAT 35500.

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

*Calculus III Option; Students should earn a C or better.*

- MA 26100 - Multivariate Calculus Credits: 4.00 + or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00 +; should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (31-60 credits)

Grade Requirements

- + Students should strive to earn a C or better.

GPA Requirements

- Average GPA in courses must be 2.00 in Required Major Courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- A course can only be used once to meet a major requirement.
- Courses cannot double count across General Education, Language and Culture, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy
College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency Website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
Science Core Selection - Credit Hours: 3.00-4.00
Elective - Credit Hours: 1.00 (STAT 10100 strongly recommended)
Elective - Credit Hours: 4.00

15-18 Credits

Spring 1st Year

- CS 15900 - C Programming Credits: 3.00 ♦ or
- CS 17600 - Data Engineering In Python Credits: 3.00 or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00-4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15-18 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00 ♦
- Science Core Selection First-Year Composition - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 2.00

15-18 Credits

Spring 2nd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- MA 41600 - Probability Credits: 3.00 ♦ or
- STAT 41600 - Probability Credits: 3.00 ♦ or
- STAT 51600 - Basic Probability And Applications Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00
• Applied Statistics Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 2.00-3.00
• Elective - Credit Hours: 1.00-3.00

12-15 Credits

Fall 4th Year

• STAT 51200 - Applied Regression Analysis Credits: 3.00 or - this course is only allowed to meet the requirement for students dual majoring in Actuarial Science or Actuarial Science Honors
• Great Issues Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 0.00-3.00
• Elective (recommended STS course) - Credit Hours: 1.00-3.00
• Electives - Credit Hours: 3.00

12-15 Credits

Spring 4th Year

• MA 36200 - Topics In Vector Calculus Credits: 3.00 or
• STAT 42000 - Introduction To Time Series Credits: 3.00
• Applied Statistics Selective - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

12-14 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-
Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Data Science, BS (Statistics)

About the Program

Majoring in data science at Purdue will place you at the forefront of an emerging field and prepare you for an exciting career at the intersection of computer science and statistics.

Created jointly by Purdue's Department of Computer Science and Department of Statistics, the data science major will open pathways to careers in virtually every area of society, from healthcare, security and sustainability to education, business and economics.

Data Science Major

Data Science (Statistics) Major Change (CODO) Requirements

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
• AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
• Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

• Composition and Presentation
• Computing
• Cultural Diversity (Language and Culture)
• General Education
• Great Issues in Science
• Laboratory Science
• Mathematics
• Science Technology and Society
• Statistics
• Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Degree Requirements

120 Credits Required

Data Science Major Courses (47-51 credits)

Must have a C or better in all courses.

• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 (satisfies Computing, and Team-Building and Collaboration, for College of Science core)
• CS 18200 - Foundations Of Computer Science Credits: 3.00
• CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00
• CS 38003 - Python Programming Credits: 1.00
• CS 44000 - Large Scale Data Analytics Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• STAT 35500 - Statistics For Data Science Credits: 3.00 (satisfies Statistics for College of Science core)
• STAT 41600 - Probability Credits: 3.00
• STAT 41700 - Statistical Theory Credits: 3.00
• CS 24200 - Introduction To Data Science Credits: 3.00 or
• STAT 24200 - Introduction To Data Science Credits: 3.00
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00

Ethics Selective (3 credits)

Must have a C or better in all courses.

Choose 1.

• ILS 23000 - Data Science And Society: Ethical Legal Social Issues Credits: 3.00 *(satisfies 3.0 credits of GE for College of Science core)*
• PHIL 20700 - Ethics For Technology, Engineering, And Design Credits: 3.00 *(satisfies Science, Technology, and Society and 3.0 credits of GE for College of Science core)*
• PHIL 20800 - Ethics Of Data Science Credits: 3.00 *(must be 3.00 Credit Hour option; satisfies Science, Technology, and Society and 3.0 credits of GE for College of Science core)*

CS Selectives (6 credits)

Must have a C or better in all courses.

Choose 2.

• CS 31400 - Numerical Methods Credits: 3.00
• CS 35500 - Introduction To Cryptography Credits: 3.00
• CS 43900 - Introduction To Data Visualization Credits: 3.00
• CS 47100 - Introduction To Artificial Intelligence Credits: 3.00
• CS 47300 - Web Information Search And Management Credits: 3.00
• CS 47500 - Human-Computer Interaction Credits: 3.00
• CS 30700 - Software Engineering I Credits: 3.00 or
• CS 40800 - Software Testing Credits: 3.00
• CS 34800 - Information Systems Credits: 3.00 or
• CS 44800 - Introduction To Relational Database Systems Credits: 3.00
• CS 38100 - Introduction To The Analysis Of Algorithms Credits: 3.00 or
• CS 48300 - Introduction To The Theory Of Computation Credits: 3.00

Statistics Selective (3 credits)

Must have a C or better in all courses.

Choose 1.

• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• STAT 42000 - Introduction To Time Series Credits: 3.00
• STAT 50600 - Statistical Programming And Data Management Credits: 3.00
• STAT 51200 - Applied Regression Analysis Credits: 3.00
• STAT 51300 - Statistical Quality Control Credits: 3.00
• STAT 51400 - Design Of Experiments Credits: 3.00
Capstone Experience (3 credits)

CS 37300 must be completed with a grade of C or better prior to the start of the Capstone Experience.

Students choosing a Zero-Credit Capstone Experience Option must complete an additional selective from either the CS Selectives or the Statistics Selectives course lists.

Must have a C or better in all courses.

Choose 1 option below.

Credit Course Options:

• STAT 49000 - Topics In Statistics For Undergraduates Credits: 1.00 to 5.00
  -Approved Research Project In Data Science - Credit Hours: 3.00
  -Data Science Capstone - Credit Hours: 3.00
• CS 49000 - Topics In Computer Sciences For Undergraduates Credits: 1.00 to 5.00
  -DSC Data Science Capstone - Credit Hours: 3.00
• CS 43900 - Introduction To Data Visualization Credits: 3.00 (Cannot be used to meet both Capstone and as CS Selective)
• CS 30700 - Software Engineering I Credits: 3.00 - Project must be approved; cannot be used to meet both Capstone and as CS elective.
• CS 49700 - Honors Research Project Credits: 3.00 - project must be approved.
• EPCS 41100 - Senior Design Participation In EPICS Credits: 1.00 and
• EPCS 41200 - Senior Design Participation In EPICS Credits: 2.00 - project must be approved.

Zero-Credit Options:

• CS 38600 - Professional Practice IV Credits: 0.00
• CS 48700 - Professional Practice V Credits: 0.00
• CS 49000 Research Project in Data Science-Project must be approved. - Credit Hours: 0.00 or
• STAT 49000 Research Project in Data Science-Project must be approved. - Credit Hours: 0.00

Other Departmental/Program Course Requirements (29-52 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose 1 course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take 1 course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)
Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.

*Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.

International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing

Met with required major coursework.

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

- Language & Culture Option I
- Language & Culture Option II
- Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

- General Education Option I (Met with required major coursework)
- General Education Option II
- General Education Option III

Great Issues In Science (3 credits)

Choose 1 from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00 (must have C or better to meet prerequisite for CS 18200)
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 (must have a C or better to meet pre-requisite for STAT35500) or
MA 16600 - Analytic Geometry And Calculus II Credits: 4.00 (must have C or better to meet pre-requisite for STAT 35500)

Science Technology & Society^* (1-3 credits)

Choose 1 from the Science Technology and Society list here.

Statistics

*Met with required major coursework.

Team-Building and Collaboration

*Met with required major coursework.

Electives (17-44 credits)

CS 19300 is strongly encouraged to be taken with CS 18000. CS 19300 is not a degree requirement.

Grade Requirements

- CS 37300 must be completed with a grade of C or better prior to the start of the Capstone Experience.
- *All courses required for the major, regardless of department, must be completed with a grade of "C" or better.
- *All prerequisites to CS, MA, and STAT courses required for the major, regardless of department, must be completed with a grade of "C" or better.

GPA Requirements

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

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

Transfer Credit Policy
Equivalent 10000 and 20000-level Computer Science (CS) transfer credit courses (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. Statistics program.

CS transfer credit at the 30000-40000-level may not be used to meet degree requirements. As exception to this policy is the application of pre-approved Study Abroad coursework.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost's Website.

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

- Attending six approved civics-related events and completing an assessment for each; or
- Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
- Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

- Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
- Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00
• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hour: 1.00 (CS 19300 strongly recommended)
• Elective - Credit Hour: 1.00
• Elective - Credit Hours: 3.00

16-18 Credits

Spring 1st Year

• CS 18200 - Foundations Of Computer Science Credits: 3.00
• CS 38003 - Python Programming Credits: 1.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core First Year Composition Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Electives - Credit Hours: 1.00

15-18 Credits

Fall 2nd Year

• STAT 35500 - Statistics For Data Science Credits: 3.00
• CS 24200 - Introduction To Data Science Credits: 3.00 or
• STAT 24200 - Introduction To Data Science Credits: 3.00
• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 - 3.00

14-18 Credits

Spring 2nd Year

• CS 25300 - Data Structures And Algorithms For DS/AI Credits: 3.00
• MA 35100 - Elementary Linear Algebra Credits: 3.00
• STAT 41600 - Probability Credits: 3.00
• Ethics Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
Elective - Credit Hours: 1.00 - 2.00

16-18 Credits

Fall 3rd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- CS 37300 - Data Mining And Machine Learning Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

- CS Selective - Credit Hours 3.00
- Statistics Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-17 Credits

Fall 4th Year

- CS 44000 - Large Scale Data Analytics Credits: 3.00
- CS Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 - 3.00

16-17 Credits

Spring 4th Year

- Capstone Experience/Course - Credit Hours: 0.00 - 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

13-18 Credits
Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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 - Math Emphasis Major Change (CODO) Requirements
Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
- Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (30-31 credits)
Course can only be used once to meet a major requirement.

**Required Major Courses (24 credits)**

The average GPA in courses must be 2.00 in Required Major Courses. MA 37400 can only be used to meet one requirement in the Required Major Courses. Course can only be used once to meet a major requirement.

- MA 35100 - Elementary Linear Algebra **Credits:** 3.00
- MA 35301 - Linear Algebra II **Credits:** 3.00
- MA 43200 - Elementary Stochastic Processes **Credits:** 3.00
- STAT 51200 - Applied Regression Analysis **Credits:** 3.00
- STAT 35000 - Introduction To Statistics **Credits:** 3.00 ♦ (satisfies Statistics Requirement for College of Science Core)
- MA 41600 - Probability **Credits:** 3.00 ♦ or
- STAT 41600 - Probability **Credits:** 3.00 ♦ or
- STAT 51600 - Basic Probability And Applications **Credits:** 3.00 ♦
- STAT 41700 - Statistical Theory **Credits:** 3.00 ♦ or
- STAT 51700 - Statistical Inference **Credits:** 3.00
- MA 34100 - Foundations Of Analysis **Credits:** 3.00 ♦ or
- MA 44000 - Honors Real Analysis I **Credits:** 3.00 ♦ or
- MA 44200 - Honors Real Analysis II **Credits:** 3.00
- MA 45000 - Algebra Honors **Credits:** 3.00 ♦
- MA 45300 - Elements Of Algebra I **Credits:** 3.00 ♦
- MA 49500 - Advanced Topics In Mathematics For Undergraduates **Credits:** 1.00 to 5.00
  - Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.

**Advanced Math Selective (3-4 credits)**

Choose one. Course can only be used once to meet a major requirement.

- MA 34900 - Signals And Systems For Mathematicians **Credits:** 3.00
- MA 36600 - Ordinary Differential Equations **Credits:** 4.00
- MA 37400 - Mathematical Foundations For Machine Learning **Credits:** 3.00
- MA 37500 - Introduction To Discrete Mathematics **Credits:** 3.00
- MA 42100 - Linear Programming And Optimization Techniques **Credits:** 3.00
- MA 42500 - Elements Of Complex Analysis **Credits:** 3.00
- MA 42800 - Introduction To Fourier Analysis **Credits:** 3.00
- MA 44000 - Honors Real Analysis I **Credits:** 3.00 ♦
- MA 44200 - Honors Real Analysis II **Credits:** 3.00
- MA 45000 - Algebra Honors **Credits:** 3.00 ♦
- MA 45300 - Elements Of Algebra I **Credits:** 3.00 ♦
- MA 49500 - Advanced Topics In Mathematics For Undergraduates **Credits:** 1.00 to 5.00
  - Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.

**Statistics Selective (3 credits)**

Choose one. Course can only be used once to meet a major requirement.

- CS 37300 - Data Mining And Machine Learning **Credits:** 3.00 (Data Science, Computer Science, Computer Science Honors majors only)
- IE 53000 - Quality Control **Credits:** 3.00
- MA 37400 - Mathematical Foundations For Machine Learning **Credits:** 3.00
- STAT 42000 - Introduction To Time Series **Credits:** 3.00
- STAT 51300 - Statistical Quality Control **Credits:** 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
  One 3 credit combination of the TDM courses below can be used to meet ONE STAT Selective
- TDM 10100 - The Data Mine Seminar I Credits: 1.00
- TDM 10200 - The Data Mine Seminar II Credits: 1.00
- TDM 20100 - The Data Mine Seminar III Credits: 1.00
- TDM 20200 - The Data Mine Seminar IV Credits: 1.00
- TDM 30100 - The Data Mine Seminar V Credits: 1.00
- TDM 30200 - The Data Mine Seminar VI Credits: 1.00
- TDM 40100 - The Data Mine Seminar VII Credits: 1.00
- TDM 40200 - The Data Mine Seminar VIII Credits: 1.00

Other Departmental/Program Course Requirements (37-64 credits)

COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study
* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)
Choose one course from this list. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)
Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• **Special Note**: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)
Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
• General Education Option III

Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

• Laboratory Science Option I
• Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from this list (satisfies STS for core).

Statistics

*Met with required major coursework: STAT 35000 or STAT 35500.

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option; student should earn a C or better.

• MA 26100 - Multivariate Calculus Credits: 4.00 or
• MA 27101 - Honors Multivariate Calculus Credits: 5.00 +; should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (25-53 credits)

Grade Requirements

• + Student should strive to earn a C or better.

GPA Requirements

• Average GPA in courses must be 2.00 in Required Major Courses.
• 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

• Course can only be used once to meet a major requirement.
• Courses cannot double count between General Education, Culture and Diversity, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

• Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
• The pass/no pass grade mode may be entered for courses which are not required by a student’s major(s), minor(s) or science core curriculum.
• Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
• Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
• The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the Provost’s Website.
• Human Cultures: Behavioral/Social Science (BSS)
• Human Cultures: Humanities (HUM)
• Information Literacy (IL)
• Oral Communication (OC)
• Quantitative Reasoning (QR)
• Science #1 (SCI)
• Science #2 (SCI)
• Science, Technology, and Society (STS)
• Written Communication (WC)

Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (STAT 10100 strongly recommended)
• Elective - Credit Hours: 3.00

14-17 Credits

Spring 1st Year

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
- CS 17700 - Programming With Multimedia Objects Credits: 4.00 or
- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 or
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 0.00-2.00

13-18 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00-5.00 (MA 30100 recommended)

15-16 Credits

Spring 2nd Year

- MA 35100 - Elementary Linear Algebra Credits: 3.00
- COM 21700 - Science Writing And Presentation Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 44000 - Honors Real Analysis I Credits: 3.00
- MA 41600 - Probability Credits: 3.00 or
- STAT 41600 - Probability Credits: 3.00 or
- STAT 51600 - Basic Probability And Applications Credits: 3.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

- STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00
• MA 35301 - Linear Algebra II Credits: 3.00
• Science Core Selection - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

• MA 43200 - Elementary Stochastic Processes Credits: 3.00
• STAT 51200 - Applied Regression Analysis Credits: 3.00
• Great Issues Option - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 0.00-3.00
• Elective - Credit Hours: 3.00

12-15 Credits

Spring 4th Year

• Advanced Math Selective - Credit Hours: 3.00
• Statistics Selective - Credit Hours: 3.00
• Science Core Selection - Credit Hours: 1.00-3.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 3.00

13-16 Credits

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

World Language Courses

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

Critical Course

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be
proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

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

Statistics - Math Emphasis Major Change (CODO) Requirements *(Students wishing to CODO to Statistics Honors must first CODO to Statistics - Math Emphasis.)*

Degree Requirements

120 Credits Required

Curriculum and Degree Requirements for College of Science

A College of Science degree is conferred when a student successfully completes all requirements in their degree program. Students will complete coursework or approved experiential learning activities to meet the following three degree components:

- Major
- Science Core Curriculum
- Electives

Students may use any of the following options to meet College of Science degree requirements:

- Purdue Coursework
- AP, IB, and CLEP credit. The use of AP and IB coursework varies between College of Science degree plans.
Transfer Credit. Students should consult the Admissions Transfer Credit Resource page for all available transfer options. College of Science degree programs vary widely in their approval and use of the proceeding options and thus students are strongly encouraged to work closely with their academic advisors and to regularly consult their MyPurduePlan to view the use of each option in their degree plan.

Most College of Science degree programs contain elective credits students may use to pursue courses that relate to their interests or which support their major area of study. The elective area of a degree plan may also be used to complete minors, second majors and certificates such as the Entrepreneurial Certificate. Any Purdue course may be used to meet the elective area of a student's degree plan.

College of Science Core Requirements

All Students starting Purdue University Fall semester, 2007 or later are required to pursue the 2007 Science Core curriculum.

The College of Science Core Curriculum requires the completion of approved coursework and/or experiential learning opportunities in the following academic areas:

- Composition and Presentation
- Computing
- Cultural Diversity (Language and Culture)
- General Education
- Great Issues in Science
- Laboratory Science
- Mathematics
- Science Technology and Society
- Statistics
- Teambuilding and Collaboration

Earning Core Curricular Requirements through Experience

Students may meet selected core curriculum requirements through approved experiential learning opportunities. Interested students should contact their academic advisor for more information on this option and incorporating experiential learning into their four-year program of study. For more information on earning requirements through experience, please click here.

Departmental/Program Major Courses (30-31 credits)

Course can only be used once to meet a major requirement.

Required Major Courses (24 credits)

- Average GPA in courses must be 2.00 in Required Major Courses.
- An Average GPA in MA 44000, MA 44200, MA 45000, STAT 51600 or STAT 51700 must be 3.5 or higher - must take three of these five courses*.
- MA 37400 can only be used to meet one requirement in the Required Major Courses.
- Course can only be used once to meet a major requirement.
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- MA 35301 - Linear Algebra II Credits: 3.00
- MA 43200 - Elementary Stochastic Processes Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51700 - Probability Credits: 3.00 ♦ - this course is only an option for students in Data Science majors.
- MA 41600 - Probability Credits: 3.00 ♦ or
• STAT 41600 - Probability Credits: 3.00 + or
• STAT 51600 - Basic Probability And Applications Credits: 3.00 * +
• STAT 41700 - Statistical Theory Credits: 3.00 or
• STAT 51700 - Statistical Inference Credits: 3.00 *
• MA 34100 - Foundations Of Analysis Credits: 3.00 or
• MA 44000 - Honors Real Analysis I Credits: 3.00 *

Advanced Math Selective (3-4 credits)

Choose one. Course can only be used once to meet a major requirement.

• MA 34900 - Signals And Systems For Mathematicians Credits: 3.00
• MA 36600 - Ordinary Differential Equations Credits: 4.00
• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• MA 37500 - Introduction To Discrete Mathematics Credits: 3.00
• MA 42100 - Linear Programming And Optimization Techniques Credits: 3.00
• MA 42500 - Elements Of Complex Analysis Credits: 3.00
• MA 42800 - Introduction To Fourier Analysis Credits: 3.00
• MA 44000 - Honors Real Analysis I Credits: 3.00
• MA 44200 - Honors Real Analysis II Credits: 3.00
• MA 45000 - Algebra Honors Credits: 3.00 *
• MA 52000 - Boundary Value Problems Of Differential Equations Credits: 3.00
• Check with advisor for additional approved courses.
• MA 49500 - Advanced Topics In Mathematics For Undergraduates Credits: 1.00 to 5.00
  Any MA 49500 title is acceptable; course must be at least 3.0 credits to be used as a selective course.

Statistics Selective (3 credits)

Choose one. Course can only be used once to meet a major requirement.

• MA 37400 - Mathematical Foundations For Machine Learning Credits: 3.00
• STAT 51300 - Statistical Quality Control Credits: 3.00
• STAT 51400 - Design Of Experiments Credits: 3.00
• STAT 42000 - Introduction To Time Series Credits: 3.00
• IE 53000 - Quality Control Credits: 3.00
• CS 37300 - Data Mining And Machine Learning Credits: 3.00 (Data Science, Computer Science, Computer Science Honors majors only)

  One 3 credit combination of the TDM courses below can be used to meet ONE STAT Selective
• TDM 10100 - The Data Mine Seminar I Credits: 1.00
• TDM 10200 - The Data Mine Seminar II Credits: 1.00
• TDM 20100 - The Data Mine Seminar III Credits: 1.00
• TDM 20200 - The Data Mine Seminar IV Credits: 1.00
• TDM 30100 - The Data Mine Seminar V Credits: 1.00
• TDM 30200 - The Data Mine Seminar VI Credits: 1.00
• TDM 40100 - The Data Mine Seminar VII Credits: 1.00
• TDM 40200 - The Data Mine Seminar VIII Credits: 1.00

Other Departmental/Program Course Requirements (36-64 credits)
COLLEGE OF SCIENCE CORE REQUIREMENTS

^ - Labeled as a Science Core Selection in the four year plan of study

* - Requirement may be met with a zero credit experiential learning option. See your advisor for more information.

Composition & Presentation

Written Communication (3-4 credits)

Choose one course from the Written Communication list here. (satisfies Written Communication and Information Literacy for core)

Technical Writing And Presentation* (0-6 credits)

Students may elect to take one course (COM 21700), a combination of courses, or experiences to meet the TWTP requirement. The list of approved courses and experiences can be found here. (satisfies OC for core)

• Special Note: Students completing both COM 11400 (elective) and COM 21700 (Technical Writing and Presentation requirement) may use both courses to meet degree requirements.
• *Students wishing to meet the Technical Presentation and/or Technical Writing requirement through experience are required to complete the Experiential Learning Contract process.
• International Students Only: International students whose primary high school/equivalent instruction was not in English may meet this requirement with a course option only.

Computing (3-4 credits)

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦

Cultural Diversity (Language & Culture)^* (0-9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Humanities for core).

• Language & Culture Option I
• Language & Culture Option II
• Language & Culture Option III

General Education^ (9 credits)

Choose courses from this list to fulfill each Option below (select courses COULD satisfy Behavioral/Social Science for core).

• General Education Option I
• General Education Option II
• General Education Option III
Great Issues In Science (3 credits)

Choose one from this list.

Laboratory Science (6-8 credits)

Choose courses from this list to fulfill each Option below (satisfies Science for core).

- Laboratory Science Option I
- Laboratory Science Option II

Mathematics (8-10 credits)

(satisfies Quantitative Reasoning for core)

- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00

Science Technology and Society (1-3 credits)

Choose one from the Science Technology and Society list here. (satisfies STS for core).

Statistics

Met with required major coursework: STAT 35000 or 35500.

Team-Building and Collaboration* (0-3 credits)

Choose one from this list.

Required Pre-Requisite Course (4-5 Credits)

Calculus III Option; student should earn a C or better.

- MA 26100 - Multivariate Calculus Credits: 4.00 or
- MA 27101 - Honors Multivariate Calculus Credits: 5.00
  - should only be taken by first year (first semester) students that have credit for Calculus I and II. Students should talk to their advisor about this option.

Electives (25-53 credits)

Grade Requirements

- + Student should strive to earn a C or better.
GPA Requirements

- Average GPA in courses must be 2.00 in **Required Major Courses**.
- * - Average GPA in MA 44000, MA 44200, MA 45000, STAT 51600 or STAT 51700 must be 3.5 or higher - must take three of these five courses.
- 2.0 Graduation GPA required for Bachelor of Science degree.

Course Requirements and Notes

- A course can only be used once to meet a major requirement.
- Courses cannot double count across General Education, Language and Culture, and Great Issues requirements.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

College of Science Transfer Credit Policy

College of Science degree programs vary widely in their approval and use of non-Purdue originated credit (AP, IB, CLEP, and transfer credit). Students work closely with their academic advisors and degree plan audits to review the use and approval of each non-Purdue credit option.

University Requirements

University Core Requirements

For a complete listing of University Core Course Selectives, visit the [Provost's Website](#).

- Human Cultures: Behavioral/Social Science (BSS)
- Human Cultures: Humanities (HUM)
- Information Literacy (IL)
- Oral Communication (OC)
- Quantitative Reasoning (QR)
- Science #1 (SCI)
- Science #2 (SCI)
- Science, Technology, and Society (STS)
- Written Communication (WC)
Civics Literacy Proficiency Requirement

The Civics Literacy Proficiency activities are designed to develop civic knowledge of Purdue students in an effort to graduate a more informed citizenry. For more information visit the Civics Literacy Proficiency website.

Students will complete the Proficiency by passing a test of civic knowledge, and completing one of three paths:

• Attending six approved civics-related events and completing an assessment for each; or
• Completing 12 podcasts created by the Purdue Center for C-SPAN Scholarship and Engagement that use C-SPAN material and completing an assessment for each; or
• Earning a passing grade for one of these approved courses (or transferring in approved AP or departmental credit in lieu of taking a course).

Upper Level Requirement

• Resident study at Purdue University for at least two semesters and the enrollment in and completion of at least 32 semester hours of coursework required and approved for the completion of the degree. These courses are expected to be at least junior-level (30000+) courses.
• Students should be able to fulfill most, if not all, of these credits within their major requirements; there should be a clear pathway for students to complete any credits not completed within their major.

Sample 4-Year Plan

Fall 1st Year

• MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
• MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 1.00 (STAT 10100 strongly recommended)
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 1.00-2.00

15-19 Credits

Spring 1st Year

• CS 15900 - C Programming Credits: 3.00 ♦ or
• CS 17600 - Data Engineering In Python Credits: 3.00 ♦ or
• CS 17700 - Programming With Multimedia Objects Credits: 4.00 ♦ or
• CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 ♦
• MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
• MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
• Science Core Selection - Credit Hours: 3.00 - 4.00
• Elective - Credit Hours: 3.00
• Elective - Credit Hours: 2.00

15-18 Credits
Fall 2nd Year

- MA 26100 - Multivariate Calculus Credits: 4.00 +
- Science Core Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00 (MA 30100 recommended)
- Elective - Credit Hours: 2.00

15-18 Credits

Spring 2nd Year

- COM 21700 - Science Writing And Presentation Credits: 3.00
- MA 35100 - Elementary Linear Algebra Credits: 3.00
- STAT 35000 - Introduction To Statistics Credits: 3.00 ♦ or
- STAT 35500 - Statistics For Data Science Credits: 3.00 ♦
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15 Credits

Fall 3rd Year

- MA 34100 - Foundations Of Analysis Credits: 3.00 or
- MA 44000 - Honors Real Analysis I Credits: 3.00 *
- MA 41600 - Probability Credits: 3.00 + or
- STAT 41600 - Probability Credits: 3.00 + or
- STAT 51600 - Basic Probability And Applications Credits: 3.00 +*
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-16 Credits

Spring 3rd Year

- STAT 41700 - Statistical Theory Credits: 3.00 or
- STAT 51700 - Statistical Inference Credits: 3.00 *
- Advanced MA Selective - Credit Hours: 3.00 - 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

15-16 Credits

Fall 4th Year
- MA 43200 - Elementary Stochastic Processes **Credits:** 3.00
- STAT 51200 - Applied Regression Analysis **Credits:** 3.00
- Great Issues Option - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 0.00-3.00

**12-15 Credits**

**Spring 4th Year**

- MA 35301 - Linear Algebra II **Credits:** 3.00
- Statistics Selective - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 1.00-3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

**13-15 Credits**

**Pre-Requisite Information**

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

**World Language Courses**

World Language proficiency requirements vary by program. The following list is inclusive of all world languages PWL offers for credit; for acceptable languages and proficiency levels, see your advisor. (ASL-American Sign Language; ARAB-Arabic; CHNS-Chinese; FR-French; GER-German; GREK-Greek(Ancient); HEBR-Hebrew(Biblical); HEBR-Hebrew(Modern); ITAL-Italian; JPNS-Japanese; KOR-Korean; LATN-Latin; PTGS=Portuguese; RUSS-Russian; SPAN-Spanish)

**Critical Course**

The ♦ course is considered critical.

In alignment with the Degree Map Guidance for Indiana's Public Colleges and Universities, published by the Commission for Higher Education (pursuant to HEA 1348-2013), a Critical Course is identified as "one that a student must be able to pass to persist and succeed in a particular major. Students who want to be nurses, for example, should know that they are expected to be proficient in courses like biology in order to be successful. These would be identified by the institutions for each degree program."

**Disclaimer**

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.
Minor

Statistics Minor

Requirements for the Minor (15 credits)

- Before undertaking this minor, the student must establish the prerequisites for the required minor courses.
- ALL COURSES REQUIRED FOR THIS MINOR MUST BE TAKEN AT PURDUE UNIVERSITY
- Transfer, AP, IB, and A LEVEL credit cannot be used for the minor.
- P/NP option is not allowed for the minor
- Students must earn a 2.0 average in MA/STAT/IE/MGMT courses required for the minor.

Area 1 - Choose One (3 credits)

- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 35500 - Statistics For Data Science Credits: 3.00
- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 51100 - Statistical Methods Credits: 3.00
- MGMT 30500 - Business Statistics Credits: 3.00 (School of Management Majors Only; B- or better required)
- IE 33000 - Probability And Statistics In Engineering II Credits: 3.00 (Industrial Engineering Majors Only; B- or better required)

Area 2 - Choose One (3 credits)

- STAT 22500 - Introduction To Probability Models Credits: 3.00
- STAT 31100 - Introductory Probability Credits: 3.00
- STAT 41600 - Probability Credits: 3.00
- MA 41600 - Probability Credits: 3.00
- IE 23000 - Probability And Statistics In Engineering I Credits: 3.00 (Industrial Engineering Majors Only; B- or better required)

Area 3 (3 credits)

- STAT 51200 - Applied Regression Analysis Credits: 3.00

Area 4 - Choose Two (6 credits)

- IE 33600 - Operations Research - Stochastic Models Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
- STAT 51300 - Statistical Quality Control Credits: 3.00 or
- IE 53000 - Quality Control Credits: 3.00

Due to Minor Requirements and Pre-requisites, Below are the Suggested Pathways for Specific Majors
Krannert School of Management Majors

- MGMT 30500 - Business Statistics Credits: 3.00 (B- or better required)
- STAT 31100 - Introductory Probability Credits: 3.00 or
- STAT 22500 - Introduction To Probability Models Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51300 - Statistical Quality Control Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00

Industrial Engineering Majors

- IE 33000 - Probability And Statistics In Engineering II Credits: 3.00 (B- or better required)
- IE 23000 - Probability And Statistics In Engineering I Credits: 3.00 (B- or better required)
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
- STAT 51300 - Statistical Quality Control Credits: 3.00 or
- IE 53000 - Quality Control Credits: 3.00

Pharmacy, Nursing, Biology, Agriculture Majors (Majors that utilize STAT 50300)

- STAT 50300 - Statistical Methods For Biology Credits: 3.00
- STAT 22500 - Introduction To Probability Models Credits: 3.00 or
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
- STAT 51300 - Statistical Quality Control Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00

Majors that require MA 26100 (Calculus III)

If your specific major is not listed, but your major requires you to take Calculus III, this is the suggested pathway through the minor. Mathematics majors should consider a dual major in Mathematics with Statistics instead of adding a Statistics minor.

- STAT 35000 - Introduction To Statistics Credits: 3.00
- STAT 41600 - Probability Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 41700 - Statistical Theory Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00

Majors that do not require MA 26100 (Calculus III)

If your specific major is not listed, but your major DOES NOT require you to take Calculus III, this is the suggested pathway through the minor.

- STAT 35000 - Introduction To Statistics Credits: 3.00 or
- STAT 51100 - Statistical Methods Credits: 3.00
- STAT 22500 - Introduction To Probability Models Credits: 3.00
- STAT 51200 - Applied Regression Analysis Credits: 3.00
- STAT 51300 - Statistical Quality Control Credits: 3.00
- STAT 51400 - Design Of Experiments Credits: 3.00
Notes

- AT LEAST 9 credits of the 15 credit hour minor must be STAT courses. IE 53000 and MA 41600 are considered STAT courses due to cross-listing
- Courses that do not require calculus, such as PSY 20100 and SOC 38200 are not equivalent to the courses listed.
- Credit for the STAT minor is not allowed for more than one course in each group (per Course Catalog descriptions):
  - STAT 22500, STAT 31100, STAT 41600 or MA 41600
  - STAT 35000, STAT 35500, STAT 50100
  - STAT 50300 and STAT 51100

Pre-Requisite Information

For pre-requisite information, log in to mypurdue.purdue.edu and click here.

Disclaimer

The student is ultimately responsible for knowing and completing all degree requirements. Consultation with an advisor may result in an altered plan customized for an individual student. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Comparative information about Purdue University and other U.S. educational institutions is also available through the College Navigator tool, provided by the National Center for Education Statistics, and through the U.S. Department of Education College Scorecard.

Pre-Program

Data Science First Year (Statistics)

Data Science First Year

Program Requirements (25-28 credits)

Must have a C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *  (satisfies Computing and Teambuilding for College of Science core)
- CS 18200 - Foundations Of Computer Science Credits: 3.00 *
- CS 38003 - Python Programming Credits: 1.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or
- MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or
- MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00
- Science Core Selection - Credit Hours: 3.00
Elective - Credit Hours: 4.00

Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming Credits: 4.00 *
- CS 19300 - Tools Credits: 1.00
- MA 16100 - Plane Analytic Geometry And Calculus I Credits: 5.00 or MA 16500 - Analytic Geometry And Calculus I Credits: 4.00
- Science Core Selection - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

16-17 Credits

Spring 1st Year

- CS 18200 - Foundations Of Computer Science Credits: 3.00
- CS 38003 - Python Programming Credits: 1.00
- MA 16200 - Plane Analytic Geometry And Calculus II Credits: 5.00 or MA 16600 - Analytic Geometry And Calculus II Credits: 4.00
- Science Core First Year Composition Selection - Credit Hours: 3.00-4.00
- Science Core Selection - Credit Hours: 3.00
- Elective - Credit Hours: 1.00

15-17 Credits

Notes

- CS 19300 is a corequisite with CS 18000. CS19300 is not a degree requirement.
- *All CS, MA, and STAT courses required for the major, must be completed with a grade of "C" or better.
- *All prerequisites to CS, MA, and STAT courses required for the major, regardless of department, must be completed with a grade of "C" or better.

College of Science Pass/No Pass Option Policy

- Only electives and courses at the 50000-level general education requirement may be taken under the pass/no pass option.
- The pass/no pass grade mode may be entered for courses which are not required by a student's major(s), minor(s) or science core curriculum.
- Grade mode Passing is equivalent to at a minimum grade of C- had a letter grade been awarded.
- Students may elect to use the pass/no pass option for no more than 20% of the 124/120 credit requirement for graduation and for no more than two courses per academic year (Fall-Summer).
- The pass/no pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
• Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade.
• Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.
College of Science (Graduate)

Department of Biological Sciences (Graduate)

Website URL:
https://www.bio.purdue.edu/Academic/graduate/index.html

Department/School Head:
Janice Evans (Head)

Graduate Office Contact
Patricia Dimmitt, poliver@purdue.edu
biology.graduate.office@purdue.edu

Academic Programs:

Master's and Ph.D. Programs

- Graduate study in Biological Sciences at Purdue University is multi-disciplinary, offering a wide variety of choices for a doctorate and master's degrees. Areas of research include Biology Education; Cell & Molecular Biology; Ecology & Evolutionary Biology; Microbiology, Immunology, & Infectious Disease; Neuroscience & Physiology; Structural and Computational Biology and Biophysics. A major advisor may be selected in any of these areas. In addition, several interdisciplinary programs also are available in conjunction with other departments and divisions within the University. We, therefore, welcome applicants from different disciplines such as chemistry, physics, and related fields as well as students from traditional biological backgrounds.

Regular Graduate Faculty by Rank:
Professor

Bartlett, Edward L.
Csonka, Leslie, N.
Evans, Janice
Fernandez-Juricic, Esteban,
Gelvin, Stanton B.
Gribskov, Michael,
Hollenbeck, Peter J.
Jiang, Wen
Kihara, Daisuke,
Kuhn, Richard J.
Lucas, Jeffrey R.
Lou, Zhao-Qing
Mesecar, Andrew, David
Minchella, Dennis J.
Paschou, Peristera
Ready, Donald F.
Sahley, Christie L.
Staiger, Chris J.
Suter, Daniel M.
Stauffacher, Cynthia V.
Subramanian, Ramaswamy
Tesmer, John
Zhou, Daoguo

Associate Professor

Aguilar, Ruben, Claudio
Bernal, Ximena, E.
Camarillo, Ignacio, G.
Chang, Henry, C.
Christie, Mark
Chubykin, Alexander
Deng, Qing
Eichinger, David
Friedman, Alan M.
Gardner, Stephanie M.
Guzey, S. Selcen
Kasinski, Andrea
Leung, Yuk Fai
Lyon, Angeline
Mattoo, Seeman
Noinaj, Nicholas
Sanders, David A.
Searle, Catherine, L

Assistant Professor

Allen-Peterson, Brittany
Chang, Leifu
Cui, Meng
Dooley, Jimmy
Hanna, Jason
He, Qixin
McNickle, Gordon
Metskas, Lauren Ann
Metzger, Brian
Munoz-Gomez, Sergio
Olson, Matthew
Park, Daniel
Pluta, Scott
Robles, Estuardo
Wainwright, Dylan

**Emeritus Faculty**

John Anderson
Arthur Arnson
Timothy Baker
Anna Berkovitz
Jeffrey T. Bolin
David Bridges
Alfred J. Chiscon
Martha Chiscon
William Cramer
Richard Dilley
Donna Fekete
Michael Forman
Richard Howard
Robert Hurst
Laurie Iten
Stephen F. Konieczny
Allan Konopka
Mark Levinthal
Levy, Morris
Sanford Ostroy
William Pak
Nancy Pelaez
Samuel Postlethwait
Kerry Rabenold
William Ray
Kenneth Robinson
Michael G. Rossman
Louis Sherman
Elizabeth Taparowsku
Joseph Vanable
Peter Waser

**Research Faculty**
Master of Science

Biological Sciences, MS

Concentrations:

- Biochemistry - Molecular Biology
- Biology for Educators
- Biomolecular Structure and Biophysics - PULSe
- Biophysics
- Cancer Research
- Cell Biology
- Chemical Biology - PULSe
- Chromatin Regulation Gene Expression - PULSe Concentration, MS
- Computational & Systems Biology - PULSe
- Computational Life Science
- Computational Science
- Developmental Biology
- Ecology
- Genetics
- Immunology and Infectious Diseases - PULSe
- Integrative Neuroscience - PULSe
- Integrative Plant Science - PULSe
- Interdisciplinary Ecological Science & Engineering
- Membrane Biology - PULSe
- Microbiology - PULSe
- Microbiology
- Molecular Biology
- Molecular Evolutionary Genetics
- Molecular Signaling and Cancer Biology - PULSe
- Molecular Virology
- Neuroscience
- Plant Biology - PULSe
- Virology

Doctor of Philosophy
Biological Sciences, PHD

Concentrations:

- Biochemistry - Molecular Biology
- Biochemistry
- Biomolecular Structure and Biophysics - PULSe
- Biophysics
- Cancer Research
- Cell Biology
- Chemical Biology - PULSe
- Chromatin Regulation Gene Expression - PULSe
- Computational & Systems Biology - PULSe
- Computational Life Science
- Computational Science
- Developmental Biology
- Ecology
- Genetics
- Immunology and Infectious Diseases- PULSe
- Integrative Neuroscience - PULSe
- Integrative Plant Science - PULSe
- Biological Sciences, Interdisciplinary Ecological Science & Engineering Concentration, PHD
- Interdisciplinary Ecological Science & Engineering
- Membrane Biology - PULSe
- Microbiology - PULSe
- Microbiology
- Molecular Biology
- Molecular Evolutionary Genetics
- Molecular Signaling and Cancer Biology - PULSe
- Molecular Virology
- Neuroscience
- Plant Biochemistry & Molecular Biology
- Plant Biology - PULSe
- Plant Cell & Developmental Biology
- Plant Physiology
- Plant Ecology, Evolution and Systematics
- Structural Biology
- Virology

- Department of Chemistry (Graduate)

Website URL:
Department/School Head:

Christine A. Hrycyna

Academic Programs:

Master's and Ph.D. Programs

The Graduate Program in Chemistry provides opportunities for graduate study and cutting-edge research across all areas of Chemistry. Purdue has the second largest Ph.D. program in Chemistry in the United States, graduating more than 50 Ph.D. students every year. Particular strengths include Analytical Chemistry (US News ranks our program as the #1 Analytical Chemistry Graduate Program in the country), drug discovery, and chemical biology. Strength in Synthetic Organic Chemistry has produced two Nobel Prizes for department faculty (H.C. Brown in 1979 and Ei-ichi Negishi in 2010).

M.S. and Ph.D. degrees are offered

Concentrations (Areas of Study):

- analytical chemistry
- biochemistry and chemical biology
- inorganic chemistry
- materials chemistry
- organic chemistry
- physical chemistry

Research in the department is conducted in such interdisciplinary areas as bioanalytical, bioorganic, bioinorganic chemistry, physical organic chemistry, organometallic chemistry, and chemical physics.

Regular Graduate Faculty by Rank:

Professor

Suzanne C. Bart
Bryan Boudouris
Jean A. Chmielewski
Graham Cooks
Shelley Claridge
Chittaranjan Das
Arun K. Ghosh
Christine A. Hrycyna
Libai Huang
Wen Jiang
Sabre Kais
Hilkka I. Kenttamaa
Alexander Laskin
Julia Laskin
Philip S. Low
Chengde Mao
Scott A. McLuckey
Jianguo Mei
Andrew D. Mesecar
P.V. Ramachandran
Tong Ren
Kavita Shah
Garth J. Simpson
Herman Sintim
Lyudmila Slipchenko
W. Andy Tao
David H. Thompson
Marcy H. Towns
Adam Wasserman
Alexander Wei
Jonathan Wilker
Danzhou Yang
Zhong-Yin Zhang

**Associate Professor**

Ryan Altman
Jeffrey Dick
Christina Li
Mark A. Lipton
Angeline Lyon
Greg Michalski
Severin Schneebeli
Christopher Uyeda
Paul Wenthold

**Assistant Professor**

Abram Axelrod
Ming Chen
Gaurav Chopra
Bryon Drown
Jonathan Hood
Hanzhe Liu
Shalini Low-Nam
Lauren Ann Metskas
Elizabeth Parkinson
Michael Reppert
Shiliang Tian
Valentin Walther
Chi Zhang

**Adjunct Professor**
Emeritus Faculty

Adelman, S.
Ben-Amotz, D.
Bina, M.
Brewster, J. H.
Francisco, J. S.
Fuchs, P. L.
Grimley, R. T.
Grutzner, J. B.
Kissinger, P.
Light, A.
Lipschutz, M.
Lytle, F. E.
McMillin, D.R.
Muller, N.
Morrison, H. A.
Nakhleh, M. B
Pardue, H. L.
Richardson, J.
Regnier, F. E.
Robinson, W. R.
Shepson, P.B
Van Etten, R. L.
Walton, R. A.
Wirth, M.J.

Master of Science

Chemistry, MS

Concentrations:

- Biochemistry - Molecular Biology
- Biomolecular Structure and Biophysics - PULSe
- Chemical Biology - PULSe
- Computational Life Science
- Computational Science
- Immunology and Infectious Diseases- PULSe
- Integrative Neuroscience - PULSe
- Membrane Biology - PULSe
- Microbiology - PULSe
- Molecular Signaling and Cancer Biology - PULSe
- Molecular Virology - PULSe
- Virology
Doctor of Philosophy

Chemistry, PHD

Concentrations:

- Biochemistry - Molecular Biology
- Biomolecular Structure and Biophysics - PULSe
- Chemical Biology - PULSe
- Chemical Education/Engineering Education
- Computational Life Science
- Computational Science
- Immunology and Infectious Diseases- PULSe
- Integrative Neuroscience - PULSe
- Interdisciplinary Genetics
- Membrane Biology - PULSe
- Microbiology - PULSe
- Molecular Signaling and Cancer Biology - PULSe
- Molecular Virology - PULSe
- Plant Biochemistry & Molecular Biology
- Plant Cell & Developmental Biology
- Plant Ecology, Evolution and Systematics
- Plant Physiology
- Virology

Department of Computer Science (Graduate)

Website URL:

https://www.cs.purdue.edu/graduate/index.html

Department/School Head:

Petros Drineas

Academic Programs:

Master's and Ph.D. Programs
The Department of Computer Science offers MS and Ph.D. degrees. The master's program prepares students for admission to a Ph.D. program or for work in the industry. The doctoral program is designed to prepare students for a career in computer science research. Research areas include Artificial Intelligence, Machine Learning, and Natural Language Processing, Bioinformatics and Computational Biology, Computer Architecture, Computational Science and Engineering, Databases and Data Mining, Distributed Systems, Graphics and Visualization, Human-Computer Interaction, Information Security and Assurance, Networking and Operating Systems, Programming Languages and Compilers, Software Engineering, Robotics and Computer Vision, Theory of Computing, Algorithms, and Quantum Computing.

- **M.S.**
  - Computer Science (thesis or non-thesis)
  - Concentration in Statistics and Computer Science
  - Concentration in Computational Science and Engineering (CSE)
  - Concentration in Computational Life Sciences (CLS)
  - Concentration in Information and Cybersecurity (ISCY)
- **Ph.D.**
  - Computer Science
  - Concentration in Computational Science and Engineering (CSE)
  - Concentration in Computational Life Sciences (CLS)

**Areas of Study:**

- Artificial Intelligence, Machine Learning, and Natural Language Processing
- Bioinformatics and Computational Biology
- Computer Architecture
- Computational Science and Engineering
- Databases and Data Mining
- Distributed Systems
- Graphics and Visualization
- Human-Computer Interaction
- Information Security and Assurance
- Networking and Operating Systems
- Programming Languages and Compilers
- Robotics and Computer Vision
- Software Engineering
- Theory of Computing, Algorithms, and Quantum Computing

**Combined Degree Programs (Undergraduate Degree / Master's Degree):**

- Fifth-Year Combined BS/MS in Computer Science

**Regular Graduate Faculty by Rank:**

Professor
Walid Aref
Mikhail Atallah
Saugata Basu
Bedrick Benes
Elisa Bertino
Bharat Bhargava
Chris Clifton
Douglas Comer
Tamal Dey
Petros Drineas
Sonia Fahmy
David Gleich
Ananth Grama
Susanne Hambrusch
Suresh Jagannathan
Daisuke Kihara
Ninghui Li
Zhiyuan Li
Jennifer Neville
Alex Pothen
Sunil Prabhakar
Vernon Rego
Elisha Sacks
Eugene Spafford
Wojciech Szpankowski
Lin Tan
Dongyan Xu
Xiangyu Zhang

Associate Professor

Daniel Aliaga
Aniket Bera
Jeremiah Blocki
Buster Dunsmore
Dan Goldwasser
Elena Grigorescu
Changhee Jung
Aniket Kate
Majid Kazemian
Hemanta Maji
Ryan Newton
Kihong Park
Chunyi Peng
Voicu Popescu
Xuehai Qian
Bruno Ribeiro
Tiark Rompf
Xavier Tricoche
Paul Valiant
Vassilis Zikas
Assistant Professor

Antonio Bianchi
Simina Branzei
Brian Bullins
Joseph Campbell
Berkay Celik
Ben Delaware
Pedro Fonseca
Christina Garman
Steve Hanneke
Sooyeon Jeong
Rajiv Khanna
Zak Kingston
Anuran Makur
Yuxian Peng
Alex Psomas
Kent Quanrud
Ahmed Qureshi
Eric Samperton
Abulhair Saparov
Muhammad Shahbaz
Kazem Taram
Dave Tian
Jianguo Wang
Yexiang Xue
Raymond Yeh
Ming Yin
Ruqi Zhang
Tianyi Zhang
Yongle Zhang

Professor of Practice

George Adams
Andres Bejarano Posada
Hisham Benotman
Tony Bergstrom
Michael Borkowski
Chris May
Gustavo Rodriguez-Rivera
Sarah Sellke
Mary Ann Smart
Jeff Turkstra

Master of Science

Computer Science, MS
Concentrations:

- Computational Life Sciences (CLS)
- Computational Science and Engineering (CSE)
- Information Security for Computing Professionals (ISCP)
- Statistics & Computer Science

Doctor of Philosophy

Computer Science, PHD

Concentrations:

- Computational Life Sciences (CLS)
- Computational Science and Engineering (CSE)

Department of Earth, Atmospheric, and Planetary Sciences (Graduate)

Website URL:

http://www.eaps.purdue.edu/for_students/graduate/

Department/School Head:

Daniel J. Cziczo

Academic Programs:

Master's and Ph.D. Programs

- EAPS offers graduate research programs leading to the Master of Science (MS) and Doctor of Philosophy (Ph.D.) degrees.

EAPS is a multidisciplinary department in the College of Science offering graduate research programs in Atmospheric Sciences, Environmental Geoscience, Geodata Science Initiative, Geology and Geophysics, and Planetary Sciences, leading to MS and Ph.D. degrees. Our research incorporates a wide range of innovative observational and experimental techniques in both field and laboratory settings, as well as advanced numerical modeling methods, to address some of the most challenging interdisciplinary questions about the past, present, and future state of the Earth and other planetary
systems. These topics of study include processes operating from deep in the interior to the surficial environments of Earth and other planetary bodies, severe weather and climate, energy and environmental resources, hydrology and water resources, and many more. Our former students are now employed by universities, major research institutions, government agencies, and industry.

Research Areas:

- Atmospheric Science
- Environmental Science
- Geodata Science (MS)
- Geology and Geophysics
- Planetary Science

Regular Graduate Faculty by Rank:

Professor

Daniel Cziczo
Lucy Flesch
Andrew Freed
Darryl Granger
Matthew Huber
Cliff Johnston
Greg Michalski
Kenneth D. Ridgway
Douglas Schmitt
Dan Shepardson
Roger Wiens
Qianlai Zhuang

Associate Professor

Michael Baldwin
Daniel R. Chavas
Marty Frisbee
Briony Horgan
Brandon Johnson
Yunyue Elita Li
Nathaniel A. Lifton
David Minton
Robin Tanamachi
Wen-wen Tung
Yuan Wang
Lisa Welp

Assistant Professor
Assistant Professor of Practice

Saad Haq
Alexandria Johnson
Gouri Prabhakar

Visiting Assistant Professor

Andrea Orton

Emeritus Faculty

Ernest Agee
Lawrence Braile
John Cushman
Joseph Francisco
Alexander Gluhovsky
Jon Harbor
Harshvardhan Harshvardhan
William Hinze
Robert Nowack
Paul Shepson
Yuch-Ning Shieh
Phillip J. Smith
Wen-Yih Sun
Terry R West
William Zinsmeister

Master of Science

Earth, Atmospheric & Planetary Science, MS

Concentrations:
Doctor of Philosophy

Earth, Atmospheric & Planetary Science, PHD

Concentrations:

- Atmospheric Science
- Computational Science
- Earth Science Teaching
- Ecological Science & Engineering
- Engineering Geology
- Geodata Science for Professionals
- Geology
- Geophysics
- Interdisciplinary Ecological Science & Engineering
- Microbiology - PULSe

Department of Mathematics (Graduate)

Website URL:
http://www.math.purdue.edu/academic/grad/

Department/School Head:
Irena Swanson

Academic Programs:
Master's and Ph.D. Programs
Purdue's graduate mathematics program is one of the largest in the country - and one of the best. We invite prospective students to visit to meet faculty and current students and to see firsthand what Purdue has to offer.

• The Department of Mathematics offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

**Regular Graduate Faculty by Rank:**

**Professor**

Donu Arapura  
Saugata Basu  
Rodrigo Bañuelos  
Steven Bell  
Johnny Brown  
Gregery Buzzard  
Zhiqiang Cai  
Guilio Caviglia  
Min Chen  
Marius Dadarlat  
Steven Dong  
Harold Donnelly  
Alexandre Eremenko  
Andrei Gabrielov  
David Goldberg  
William Heinzer  
Birgit Kaufmann  
Ralph Kaufmann  
Laszlo Lempert  
Peijun Li  
Guang Lin  
Tong Liu  
Kenji Matsuki  
James McClure  
Ben McReynolds  
Arshak Petrosyan  
Antonio Sa Barreto  
Freydoon Shahidi  
Jie Shen  
Plamen Stefanov  
Irena Swanson  
Samy Tindel  
Andrew Toms  
Monica Torres  
Bernd Ulrich  
Uli Walther  
Changyou Wang  
Jaroslaw Włodarczyk  
Trevor Wooley  
Jianlin Xia  
Sai Kee Yeung  
Aaron Yip
Associate Professor

Mireille Boutin
Kiril Datchev
Rachel Kenney
Linquan Ma
Victor Lie
Baiying Liu
Jeremy Miller
Deepam Patel
Jonathon Peterson
Thomas Sinclair
Xiangxiong Zhang

Assistant Professor

Lvzhou Chen
Xingshan Cui
Rolando De Santiago
Yuan Gao
Isaac Harris
Haibo Liu
Emanuel Indrei
Matthew Jacobs
Christopher Janjigian
Daniel Le
Takumi Murayama
Sam Nariman
Matthew Novack
Di Qi
Manuel Rivera
Eric Samperton
Margaret Thomas
Oleksandr Tsymbaliuk
Alexandria Volkening
Jing Wang
Ning Wei
Mengyi Xu

Emeritus Faculty

Patricia Bauman
James Becker
Mark Benjamin
Lawrence Brown
David Catlin
Carl Cowen
John Cushman
Burgess Davis
Louis de Branges
David Drasin
Michael Drazin
Zhilan "Julie" Feng
Walter Gautschi
Daniel Gottlieb
Mervin Keedy
Joseph Lipman
Leonard Lipshitz
Bradley Lucier
Robert Lynch
Tzuong-Tsieng Moh
Richard Penney
Daniel Phillips
Juan Santos
Robert Skeel
Sam Wagstaff
Joseph Wang
Allen Weitsman

Master of Science
Mathematics, MS

Concentrations:
- Computational Finance
- Computational Life Science
- Computational Science

Doctor of Philosophy
Mathematics, PHD

Concentrations:
- Computational Life Science
- Computational Science

Department of Physics and Astronomy (Graduate)
Purdue's Department of Physics and Astronomy is a recognized world leader in many areas of theoretical and experimental research. Forefront research in physics, cutting across several disciplines are being carried out by high quality, motivated graduate students and world-renowned, dedicated faculty in the department. Our present and future students will support the active research that is being carried out in the following areas: Accelerator Mass Spectrometry, Applied Physics, Astrophysics, Atomic, Molecular, and Optical Physics, Biological Physics, Condensed Matter Physics, High Energy Nuclear Physics, High Energy Particle Physics, Physics Education, Planetary Physics and Geophysics.

- M.S.
- Ph.D.

Concentrations (Areas of Study):

- Accelerator Mass Spectrometry
- Applied Physics
- Astrophysics
- Atomic, Molecular, and Optical Physics
- Biological Physics
- Condensed Matter Physics
- High Energy Nuclear Physics
- High Energy Particle Physics
- Physics Education
- Planetary Physics and Geophysics
- Quantum Information Science

Regular Graduate Faculty by Rank:

Professor

Lynn Bryan
Marc Caffee
Erica Carlson
Yong P. Chen
Gabor Csathy
Stephen M. Durbin
Daniel S. Elliott
John P. Finley
Ephraim Fischbach
Dimitrios Giannios
Chris Greene
Brigit Kaufmann
Sergei Khlebnikov
David S. Koltick
Martin Kruczynski
Rafae Lang
Yuli Lyanda-Geller
Maxim Lyutikov
Oana Malis
Michael J. Manfra
Norbert Neumeister
David D. Nolte
Yulia Pushkar
Laura J. Pyrak-Nolte
N. Sanjay Rebello
Ken Ritchie
Francis Robicheaux
Leonid Rokhinson
Sergei Savikhin
Fuqiang Wang
Wei Xie
Qi Zhou

Associate Professor

Chen-Lung Hung
Matthew Jones
Andreas Jung
Kyoung-Soo Lee
Tongcang Li
Nathaniel A. Lifton
John Peterson
Jorge H. Rodriguez

Assistant Professor

Hadiseh Alaeian
Arnab Banerjee
Rudro R. Biswas
Xingshan Cui
Paul Duffell
Jonathan Hood
Srividya Iyer-Biswas
Nima Lashkari
Master of Science

Physics, MS

Concentrations:

- Computational Life Science
- Computational Science
- Integrated Neuroscience - PULSe

Doctor of Philosophy

Physics, PHD

Concentrations:

- Computational Life Science
- Computational Science
- Integrated Neuroscience - PULSe

Department of Statistics (Graduate)

Website URL:

http://www.stat.purdue.edu/academic_programs/graduate/index.php

Department/School Head:

Daniel Cziczo (Interim)
Academic Programs:

Master's and Ph.D. Programs

The Department of Statistics at Purdue University is recognized as one of the top statistics programs in the nation. The Department has 64 faculty members and hundreds of undergraduate and graduate students. The program prepares students for careers in both industry and academia and prepares them to be leaders in their fields.

- M.S.
  - Applied Statistics (online and residential)
  - Fifth Year Applied Statistics
  - Data Science in Finance (online and residential)
  - Mathematical Statistics or Probability
  - Joint Statistics and Computer Science
- Ph.D.
  - Ph.D. in Statistics

Regular Graduate Faculty by Rank:

Professor

William S. Cleveland
Hua Hua Chang (Courtesy)
Chris Clifton (Courtesy)
Bruce A. Craig
Anirban DasGupta
Chong Gu
Faming Liang
Dennis Lin
Guang Lin (Courtesy)
Chuanhai Liu
Jennifer Neville (Courtesy)
Raghu Pasupathy
Thomas M. Sellke
Xiao Wang
Mark Daniel Ward
Patrick Wolfe
Jun Xie
Dabao Zhang
Hao Zhang
Michael Zhu

Associate Professor
Assistant Professor

Jordan Awan
Antik Chakraborty
Zachary J. Hass (Courtesy)
Jean Honorio (Courtesy)
Nianqiao Ju
Timothy J. Keaton (Professor of Practice)
Haibo Liu
Wei Sun (Courtesy)
Jing Wang
Lin Wang
Mengyi Xu
Fei Xue

Emeritus Faculty

Mary Ellen Bock
Burgess Davis
Alexander Gluhovsky
Thomas Kuczek
George P. McCabe
David S. Moore

Master of Science

Data Science in Finance, MS (Graduate)

Statistics, MS

Concentrations:

- Applied Statistics
- Computational Finance
• Computational Life Science
• Computational Science
• Mathematical Statistics
• Statistics & Computer Science

Statistics, MS (OL)

Online added Spring 2022

Doctor of Philosophy

Statistics, PHD

Concentrations:

• Computational Life Science
• Computational Science
• Molecular Evolution Genetics - PULSe

Post-Baccalaureate Certificate

Applied Statistics, Post Baccalaureate Certificate

Applied Statistics, Post Baccalaureate Certificate (OL)
College of Science Academic Advising

Seeing a College of Science Academic Advisor

The academic advising relationship in the College of Science is a dynamic coaching, teaching, and educational collaboration where students and advisors work in partnership to attain personal, academic, and professional goals. This goal is accomplished through intentional interactions that foster informed, student-driven decisions. As a result, the academic advising experience is essential to establishing meaningful educational, career, and life goals that align with each student's values, interests, and abilities.

Our advising practice is predicated on the belief that purposeful individualized attention promotes each student's success and increases student retention through the development of academic maturity, the ability to embrace and overcome challenges, and the development of personal and academic integrity. College of Science advisors seek to encourage and inspire student engagement with their university, the global community, and the work of scientific discovery.

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.

Drop-in Appointments

Drop-in appointments are used to drop/add courses, resolve scheduling conflicts, complete paperwork, and address time-sensitive questions. Appointments are kept to 10 minutes and may not be used for registration or degree planning purposes.

Drop-in appointments are on a first-come, first-served basis, and therefore, students are not guaranteed to see their advisor during scheduled drop-in times if the number of students to be seen is greater than the time allotted. Students must see their assigned advisor unless there is an immediate need. Before visiting your advising office for a drop-in appointment, check drop-in times. Times are updated the Friday before the following week. Note: drop-in times ARE subject to change without notice.

CODO Drop-in Appointments

Students interested in a change of program (CODO) to the College of Science should consult the Non-College of Science Drop-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 for two semesters of academic advising and PIN releases as they work towards a successful CODO to their intended program. If CODO requirements are unmet by the end of their first year, students must request a CODO to another academic program or the Bridge Program while they continue to pursue their degree goals.

**Four Semester Advising Policy:**

Students who pursue a College of Science curriculum but later determine they would like to pursue an alternate program outside the College will have four semesters to CODO, starting with the first semester of enrollment in the College. However, 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
Young Hall, 6th Floor
West Lafayette, IN 47907
scienceadvising@purdue.edu
College of Science Policies

College of Science Core Requirements

Composition and Presentation Core
Computing Core
Cultural Diversity (Language and Culture)
General Education Core
Great Issues in Science
Laboratory Science Core
Mathematics Core
Multidisciplinary Experience Core
Statistics Core
Teambuilding and Collaboration Core

College of Science Academic Advising Policy Guide

The College of Science maintains policies that govern each student's relationship with the College and their path to degree completion. CoS policies work in tandem with University regulations and are maintained to ensure a standard and equitable experience for all students. University regulations provide information for all Purdue students on the structure, policy, regulations, and procedures that govern their relationship with the University in academic and personal progress toward their ultimate educational goals. Students are encouraged to see their academic advisor regarding questions or the need for further information regarding any policies in this policy guide.

College of Science Policies

- Advising and Registration Policies
- Science Core Curriculum Policies
- 4th Semester Undesignated Student Advising Policy
- Course Repeat Policy

Pass/Not Pass Option Policy

In addition to letter grade options, traditionally assigned to indicate the level of performance in classwork, an alternate grading system, the pass/not pass option, has been established. This option gives students the opportunity to broaden their education with
minimal concern for grades earned. A student who is enrolled in a course under this option has the same obligations as those who are enrolled in the course for credit with letter grade.

The Purdue Student Regulation for Semester Grades states: 2. For Credit Courses Taken under Pass/Not-Pass Option P: Passing grade; equivalent to grade A+, A, A-, B+, B, B-, C+, C or C-. N: Not passing.

College of Science P/NP Option Policy

- Free electives and courses at the 50000-level general education requirement may be applied to meet degree requirements.
- The pass/not-pass grade mode may be entered for courses not required by a student's major(s), minor(s), or the science core curriculum.
- Grade mode Passing is equivalent to a minimum grade of C- had a letter grade been awarded.
- Students may use the pass/not-pass option for up to 20% of the 120-credit requirement for graduation and for up to two courses per academic year (Fall-Summer).
- The pass/not-pass option cannot be elected for a course that has already been completed with a letter grade. University Regulation.
- Students may take elective credit while abroad using the P/NP mode. In the case of universities which only post P/NP, the University will apply a calculation process to determine a letter grade (University Regulations).
- Department of Languages and Cultures P/NP policy and Language Placement results. Students must take advanced coursework for a letter grade to receive credit for lower-level language courses.

Spring 2020 Pass/No Pass Regulation Exemption

All courses completed in the Pass mode are approved to meet any College of Science undergraduate degree requirement for Spring 2020 only.

Advising Appointment Policy

Students 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 an appointment.

Make An Advising Appointment

Registration Appointment Policy

Students will be contacted by their academic advisor each semester to schedule a registration appointment. Only one registration appointment may be scheduled at a time. Students who cannot attend their scheduled appointment are expected to cancel the appointment. If a student misses two scheduled registration appointments, they must wait until the open registration period to schedule a final registration appointment. There are no exceptions to this policy.

Registration PIN Policy
College of Science students must meet with their academic advisors each semester to discuss their degree progress, course choices, and experiential learning options. Registration PIN's are released once a student and their advisor meet and agree upon courses for the subsequent semester. There are no exceptions to this policy.

**Drop-in Appointment Policy**

Drop-in appointments are used to drop/add courses, resolve scheduling conflicts, complete paperwork, and address time-sensitive questions. Appointments are kept to 10 minutes and may not be used for registration or degree planning purposes.

Drop-in appointments are on a first-come, first-served basis, and therefore, students are not guaranteed to see their advisor during scheduled drop-in times if the number of students to be seen is greater than the time allotted. Students must see their assigned advisor unless there is an immediate need. Before visiting your advising office for a drop-in appointment, check drop-in times.