**Purdue University** **2019-2020 University Catalog**

[ARCHIVED CATALOG]

# Computer Science, BS

## About the Program

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

The Purdue University Department of Computer Science has a comprehensive and exciting curriculum for its undergraduate students. The flexible curriculum offers adventurous young women and men an excellent opportunity to be involved in a dynamic discipline that will continue to grow and to contribute significantly to progress in many other disciplines and ultimately to changes in human society that are nothing short of profound. Students learn communication skills, teamwork, and problem-solving skills and acquire the necessary technical skills for positions in computing in nearly any industry.

Computer Science students begin by taking six core courses that teach them the fundamentals of computer science. Students can then select one or more tracks, which allow them to deepen their understanding in a specific area (or areas) of Computer Science. These academic tracks include:

- Computer Science Concentration - Computational Science and Engineering Track
- Computer Science Concentration - Computer Graphics and Visualization Track
- Computer Science Concentration - Database and Information Systems Track (DBIS)
- Computer Science Concentration - Foundations of Computer Science Track (FCS)
- Computer Science Concentration - Machine Intelligence Track (MI)
- Computer Science Concentration - Programming Language Track (PL)
- Computer Science Concentration - Security Track
- Computer Science Concentration - Software Engineering Track
- Computer Science Concentration - Systems Programming Track (Systems)

Computer Science 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. With the exception of courses on the No Count List, 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
- Multidisciplinary Experience
- Statistics
- Teambuilding and Collaboration
- No Count List

**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)

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

Must have C or better to meet prerequisite for certain upper level CS courses

- MA 26100 - Multivariate Calculus or
- MA 27101 - Honors Multivariate Calculus

- MA 26500 - Linear Algebra or
- MA 35100 - Elementary Linear Algebra

### Required CS Major Core Courses (21 credits)

Must have C or better in all courses.

- CS 18000 - Problem Solving And Object-Oriented Programming ♦ (satisfies Computing and Teambuilding requirements for College of Science core)
- CS 18200 - Foundations Of Computer Science ♦
- CS 24000 - Programming In C ♦
- CS 25000 - Computer Architecture
- CS 25100 - Data Structures And Algorithms
- CS 25200 - Systems Programming

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

Please see links to all track requirements above.

Must have a C or better in all courses. Select from list.

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

## Other Departmental/Program Course Requirements (32-62 credits)

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

- ENGL 10600 - First-Year Composition (satisfies Written Communication and Information Literacy Selective for core) or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication and Information Literacy Selective for core) or
- HONR 19903 - Interdisciplinary Approaches In Writing or
- SCLA 10100 - Transformative Texts, Critical Thinking And Communication I: Antiquity To Modernity (satisfies Written Communication and Information Literacy Selective for core)

- MA 16100 - Plane Analytic Geometry And Calculus I ♦ (satisfies Quantitative Reasoning for core) (must have C or better to meet prerequisite forCS 18200) or
- MA 16500 - Analytic Geometry And Calculus I ♦ (satisfies Quantitative Reasoning for core) (must have C or better to meet prerequisite for CS 18200)

- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies Quantitative Reasoning for core) or
- MA 16600 - Analytic Geometry And Calculus II (satisfies Quantitative Reasoning for core)

- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

- Technical Writing Option* - (COM 21700 recommended) select from list - Credit Hours: 0.00 - 3.00
- Technical Presenting Option* - (COM 21700 recommended) (may satisfy Oral Communication for core) select from list - Credit Hours: 0.00 - 3.00
- Language I * - select from three options; select from list - Credit Hours: 0.00 - 4.00
- Language II * - select from three options; select from list - Credit Hours: 0.00 - 4.00
- Language and Culture III * - (may satisfy Human Cultures Humanities for core) select from three options; select from list - Credit Hours: 0.00 - 4.00

- General Education I - (may satisfy Human Culture Humanities and Behavioral/Social Science for core) select from list - Credit Hours: 3.00
- General Education II - (may satisfy Human Culture Humanities and Behavioral/Social Science for core) select from list - Credit Hours: 3.00
- General Education III - select from list - Credit Hours: 3.00
- Great Issues -select from list - Credit Hours: 3.00
- Multidisciplinary Experience * - (may satisfy Science, Technology & Society for core) select from list - Credit Hours: 0.00 - 3.00
- Teambuilding and Collaboration Experience * (CS 18000 meets requirement) - select from list - Credit Hours: 0.00 - 4.00
- Lab Science I selective - (satisfies Science for core) select from list - Credit Hours: 3.00 - 4.00
- Lab Science II selective - (may satisfy Science for core) select from list - Credit Hours: 3.00 - 4.00

## Electives (8-42 credits)

CS 19100 - Freshman Resources Seminar and CS 19300 - Tools are required freshman seminar courses; corequisites with CS 18000. They are not degree requirements. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

## University Core Requirements

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

For a complete listing of course selectives, visit the Provost's Website.

### Prerequisite Information:

For current pre-requisites for courses, click here.

## Program Requirements

### Fall 1st Year

- CS 18000 - Problem Solving And Object-Oriented Programming ♦ *** (satisfies Computing and Teambuilding and Collaboration requirement for core)

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

- ENGL 10600 - First-Year Composition or

- ENGL 10800 - Accelerated First-Year Composition or
- HONR 19903 - Interdisciplinary Approaches In Writing or
- SCLA 10100 - Transformative Texts, Critical Thinking And Communication I: Antiquity To Modernity or
- Language Level I - Credit Hours: 3.00 - 4.00

- Elective - Credit Hours: 1.00 (CS 19300 recommended)
- Elective - Credit Hours: 1.00 (CS 19100 recommended)
- Elective - Credit Hours: 1.00

### 14-16 Credits

## Spring 1st Year

- CS 18200 - Foundations Of Computer Science *** ♦
- CS 24000 - Programming In C *** ♦

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

- COM 21700 - Science Writing And Presentation or
- Language Level II - Credit Hours: 3.00 - 4.00

- Elective - Credit Hours: 1.00 - 3.00

### 14-16 Credits

## Fall 2nd Year

- CS 25000 - Computer Architecture ***
- CS 25100 - Data Structures And Algorithms ***

- MA 26100 - Multivariate Calculus or
- MA 27101 - Honors Multivariate Calculus

- Language level II - Credit Hours: 3.00 - 4.00
- Elective (CS 29100 recommended) - Credit Hours: 1.00

### 15-17 Credits

## Spring 2nd Year

- CS 25200 - Systems Programming ***

- MA 26500 - Linear Algebra or
- MA 35100 - Elementary Linear Algebra

- Elective - Credit Hours: 3.00 (COM 21700 recommended)
- Language level II or Culture course or Diversity course - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00

### 16 Credits

## Fall 3rd Year

- STAT 35000 - Introduction To Statistics or
- STAT 51100 - Statistical Methods

- Elective- Credit Hours: 3.00
- General Education I - Credit Hours: 3.00
- Elective - Credit Hours: 1.00 (CS 39100 recommended)
- CS track requirement - Credit Hours: 3.00 ***
- CS track requirement - Credit Hours: 3.00 **

### 16 Credits

## Spring 3rd Year

- CS track requirement/elective - Credit Hours: 3.00 ***
- CS track elective/requirement - Credit Hours: 3.00 ***
- Great Issues - Credit Hours: 3.00
- General Education II - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

### 15 Credits

## Fall 4th Year

- CS track elective - Credit Hours: 3.00 ***
- Lab Science I - Credit Hours: 3.00 - 4.00
- Multidisciplinary Experience/Science, Technology and Society - Credit Hours: 3.00
- General Education III - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

### 15-16 Credits

## Spring 4th Year

- CS track elective - Credit Hours: 3.00 ***
- Lab Science II - Credit Hours: 3.00 - 4.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00
- Elective - Credit Hours: 3.00

### 15-16 Credits

# Notes

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

- ***All CS core courses and all track requirements, regardless of department, must be completed with a grade of "C" or higher.
- All prerequisites to CS core courses and track requirements, regardless of department, must be completed with a grade of C or higher.
- Enrollment in freshman seminar courses CS 19100 and CS 19300 is required with CS 18000. They are not degree requirements. CS 29100 - Sophomore Development Seminar and CS 39100 - Junior Resources Seminar are optional but recommended.

## Foreign Language Courses

Foreign Language proficiency requirements vary by program.

For acceptable languages and proficiency levels, see your advisor: American Sign Language, Arabic, Chinese, French, German, (ancient) Greek, Hebrew, Italian, Japanese, Latin, Portuguese, Russian, Spanish

## Critical Course

The ♦ course is considered critical.

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.

The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.