Artificial Intelligence, BS

Return to: College of Science

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, and 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.

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
- Science Technology and Society
- 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.

Departmental/Program Major Courses (62-63 credits)

Required Major Courses (50-51 credits)

- CS 17600 - Data

Engineering In Python

- CS 18000 - Problem Solving And Object-Oriented Programming
- CS 18200 - Foundations Of Computer Science
- CS 25100 - Data Structures And Algorithms
- CS 37300 - Data Mining And Machine Learning
- CS 38100 - Introduction To The Analysis Of Algorithms
- CS 47100 - Introduction to Artificial Intelligence
- PSY 12000 - Elementary Psychology

- CS 24200 - Introduction To Data Science or
- STAT 24200 - Introduction To Data Science

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

- MA 26500 - Linear Algebra or
- MA 35100 - Elementary Linear Algebra
- MA 41600 - Probability or
- STAT 41600 - Probability

- PHIL 20700 - Ethics For Technology, Engineering, And Design or
- PHIL 20800 - Ethics Of Data Science

- PHIL 22100 - Introduction To Philosophy Of Science or
- PHIL 32200 -

Philosophy Of Technology

- PSY 20000 - Introduction To Cognitive Psychology or
- PSY 22200 - Introduction To Behavioral Neuroscience

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

CS Selective I (6 credits)

Choose two.

- CS 43900 - Introduction To Data Visualization
- CS 44000 - Large Scale Data Analytics
- CS 47300 - Web Information Search And Management
- CS 47500 - Human-Computer Interaction
- CS 57700 - Natural Language Processing

CS Selective II (3 credits)

Choose one.

- CS 34800 - Information Systems
- CS 44800 - Introduction To Relational Database Systems
- CS 48300 - Introduction To The Theory Of Computation
- CS 52300 - Social, Economic, And Legal Aspects Of Security
- CS 52900 - Security Analytics

Philosophy Selective (3 credits)

Choose one.

- PHIL 30300 - History Of Modern Philosophy
- PHIL 43200 - Theory Of Knowledge
- PHIL 43500 - Philosophy Of Mind

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)

- MA 16100 - Plane Analytic Geometry And Calculus I (must have C or better to meet prerequisite for CS 18200) or
- MA 16500 - Analytic Geometry And Calculus I (must have C or better to meet prerequisite for CS 18200)

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

Science Technology and Society^* (0 credits)

Met with PHIL 20700 or PHIL 20800 or PHIL 22100.

Statistics (0 credits)

Met with STAT 35000 or STAT 51100.

Team-Building and Collaboration (0 credits)

Met with CS 18000.

Electives (20-38 credits)

CS 19300 - Tools is a required freshman seminar course; corequisite with CS 18000. This 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.

Course Requirements and 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.

College of Science

Pass/No Pass Option Policy

- Only free electives and courses at the 50000-level general education requirement may be taken under the pass/not-pass option.
- The pass/not-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/not-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/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.
- 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
- PSY 12000 - Elementary Psychology

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

- 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
- CS 18200 - Foundations Of Computer Science

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

- PSY 20000 - Introduction To

Cognitive Psychology
or

- PSY 22200 - Introduction To Behavioral Neuroscience

14-15 Credits

Fall 2nd Year

- CS 24200 - Introduction To Data Science or
- STAT 24200 - Introduction To Data Science

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

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

- PHIL 20700 - Ethics For Technology, Engineering, And Design or
- PHIL 20800 - Ethics Of Data Science
- Science Core Selection - Credit Hours: 3.00-4.00

16-18 Credits

Spring 2nd Year

- CS 25100 - Data Structures And Algorithms

- MA 26500 - Linear Algebra
OR

- MA 41600 - Probability
OR
- MA 35100 - Elementary Linear Algebra

- STAT 41600 - Probability

- PHIL 22100 - Introduction To Philosophy Of Science
  OR
- PHIL 32200 - Philosophy Of Technology

- Science Core Selection - Credit Hours: 3.00-4.00

15-16 Credits

Fall 3rd Year

- CS 37300 - Data Mining And Machine Learning
- 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
- 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

- 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

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-Japenese; 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.

Return to: College of Science