Undergraduate Information and Special Programs

Office of the Provost

Certificate

Learning While Working CERT

About the Certificate

This certificate provides a new formal option for work-integrated experiential learning, allowing students to gain one year of professional experience while still being able to graduate in 4 years. Students will learn to balance academics with work while also learning how participate in an hybrid working model with exposure to both in-person and remote working experiences.

Requirements for the Certificate

Option 1: 2 Full Time & 4 Part Time

Complete 2 Full Time Co-Op Course
- ENGR 26099 - Learning While Working Full-Time Co-Op I **Credits:** 0.00
- ENGR 36099 - Learning While Working Full-Time Co-Op II **Credits:** 0.00

Take 4 Part Time Co-Op Course
- ENGR 36199 - Learning While Working Part-Time Co-Op I **Credits:** 0.00
- ENGR 36299 - Learning While Working Part-Time Co-Op II **Credits:** 0.00
- ENGR 46399 - Learning While Working Part-Time Co-Op III **Credits:** 0.00
- ENGR 46499 - Learning While Working Part-Time Co-Op IV **Credits:** 0.00

Option 2: 3 Full Time & 1 Part Time

Take 3 Full Time Co-Op Course
- ENGR 26099 - Learning While Working Full-Time Co-Op I **Credits:** 0.00
- ENGR 36099 - Learning While Working Full-Time Co-Op II **Credits:** 0.00
- ENGR 46099 - Learning While Working Full-Time Co-Op III **Credits:** 0.00

Complete 1 Part Time Co-Op Course
- ENGR 36199 - Learning While Working Part-Time Co-Op I **Credits:** 0.00

Learning While Working Certificate

The Learning While Working Certificate is awarded to students who gain the equivalent of one-year of working experinece through a mixture of full-time and part-time work related to their academic field studies. Students must complete 4 or 6 Learning While Working courses. This includes a combination of 2 full-time LWW sessions and 4 part-time LWW sessions or 3 full-time LWW sessions and 1 part-time LWW session. In general, students will work full-time during the summer and part-time during

the academic semesters. Part-time work will average 10-20 hours per week. Students will engage in experiential learning courses during each work period to maximize the experience through self-reflection and employer evaluation. Students must work with the same employer for multiple academic terms.

About the Certificate

This certificate provides a new formal option for work-integrated experiential learning, allowing students to gain one year of professional experience while still being able to graduate in 4 years. Students will learn to balance academics with work while also learning how participate in an hybrid working model with exposure to both in-person and remote working experiences.

Requirements for the Certificate

Option 1: 2 Full Time & 4 Part Time

Complete 2 Full Time Co-Op Course
- ENGR 26099 - Learning While Working Full-Time Co-Op I **Credits:** 0.00
- ENGR 36099 - Learning While Working Full-Time Co-Op II **Credits:** 0.00

Take 4 Part Time Co-Op Course
- ENGR 36199 - Learning While Working Part-Time Co-Op I **Credits:** 0.00
- ENGR 36299 - Learning While Working Part-Time Co-Op II **Credits:** 0.00
- ENGR 46399 - Learning While Working Part-Time Co-Op III **Credits:** 0.00
- ENGR 46499 - Learning While Working Part-Time Co-Op IV **Credits:** 0.00

Option 2: 3 Full Time & 1 Part Time

Take 3 Full Time Co-Op Course
- ENGR 26099 - Learning While Working Full-Time Co-Op I **Credits:** 0.00
- ENGR 36099 - Learning While Working Full-Time Co-Op II **Credits:** 0.00
- ENGR 46099 - Learning While Working Full-Time Co-Op III **Credits:** 0.00

Complete 1 Part Time Co-Op Course
- ENGR 36199 - Learning While Working Part-Time Co-Op I **Credits:** 0.00

Semiconductors and Microelectronics Certificate

Add to Purdue Indy per Joe Tort

Credits are 10-16. 6 hours are not credit based therefore changes need to be made to the total credit hour for the cert.

About the Certificate

The Certificate in Semiconductors and Microelectronics (16 credits) will be open to students in all undergraduate majors interested in careers in the field of semiconductors and microelectronics. This certificate will give undergraduate students broad technical exposure to topics in the areas of semiconductors and microelectronics and is designed to supplement the baccalaureate plans of studies in different majors, including (but not limited to) engineering, computer science, physics, chemistry, technology, and business. The U.S. semiconductor/microelectronics industry is facing an overwhelming and rapidly growing crunch for trained talent - with industry forecasts estimating the need at a minimum of 50,000 additional trained semiconductor engineers and scientists by 2030. The broad scope of the semiconductors and microelectronics industry - from materials and processing to

device and integrated circuit/system design, to manufacturing, supply chains, and data analytics, to testing, qualification, packaging, and thermal management - provides exciting career opportunities for students from a wide range of disciplines.

Requirements for the Certificate (10 credits)

Required Course (1 credit)

For ENGR 10301, the section titled "Introduction to Semiconductors" or similar is required.

- ENGR 10301 - Introduction To Engineering In Practice **Credits:** 1.00

Semiconductor Experience for Undergraduates

Research courses including relevant independent studies and Vertically Integrated Projects (VIP) courses, or Full-time internship relevant to technical areas of semiconductors and microelectronics. Summer or semester-long of full-time internship/co- op/SURF or similar experience is considered equivalent to 6 credit hours.

Technical Courses (9 credits)

Take at least 9 credit hours of courses in at least two out of five technical areas:

- Semiconductor and Microelectronic Devices
- Semiconductor Materials, Characterization, and Processing
- Integrated Circuit and System Design, Electronic Design Automation
- Electronics Packaging, Heterogeneous Integration, and Thermal Management
- Semiconductor Manufacturing and Global Supply Chain Management

Semiconductor and Microelectronic Devices

- ECE 30500 - Semiconductor Devices **Credits:** 3.00
- ECE 45300 - Fundamentals Of Nanoelectronics **Credits:** 3.00
- ECE 50616 - Physics And Manufacturing Of Solar Cells **Credits:** 3.00
- ECE 50631 - Fundamentals Of Current Flow **Credits:** 1.00
- ECE 50632 - Introduction To Quantum Transport **Credits:** 1.00
- ECE 50633 - Boltzmann Law: Physics To Computing **Credits:** 1.00
- ECE 50653 - Fundamentals Of Nanoelectronics **Credits:** 3.00
- ECE 55700 - Integrated Circuit Fabrication Laboratory **Credits:** 3.00
- ECE 59500 - Selected Topics In Electrical Engineering **Credits:** 1.00 to 3.00
  -Advanced Lithography
  -Essentials of Transistors
  -MEMS I: Microfabrication and Materials for MEMS
  -MEMS II: Fundamentals of MEMS Design
  -MEMS III: Applications in MEMS
  -Microfabrication Fundamentals
  -Semiconductor Fundamentals
  -Semiconductor Manufacturing
  -Theory and Practice of Solar Cells: A Cell to System Perspective
- PHYS 52600 - Physics Of Quantum Computing And Quantum Information **Credits:** 3.00

Semiconductor Materirals, Characterization, and Processing

- CHE 42000 - Process Safety Management And Analysis **Credits:** 3.00
- CHE 45600 - Process Dynamics And Control **Credits:** 3.00
- CHE 56400 - Organic Electronic Materials And Devices **Credits:** 3.00
- CHE 59700 - Special Topics In Chemical Engineering **Credits:** 0.00 to 18.00 - Manufacturing Advanced Composites
- IE 37000 - Manufacturing Processes I **Credits:** 3.00
- IE 38300 - Integrated Production Systems I **Credits:** 3.00
- IE 47000 - Manufacturing Processes II **Credits:** 3.00
- IE 57000 - Manufacturing Process Engineering **Credits:** 3.00
- IE 57900 - Design And Control Of Production And Manufacturing Systems **Credits:** 3.00
- IE 58300 - Design And Evaluation Of Material Handling Systems **Credits:** 3.00
- ME 36300 - Principles And Practices Of Manufacturing Processes **Credits:** 3.00
- ME 55700 - Design For Manufacturability **Credits:** 3.00
- MSE 23000 - Structure And Properties Of Materials **Credits:** 3.00
- MSE 27000 - Atomistic Materials Science **Credits:** 3.00
- MSE 49700 - Selected Topics In Materials Engineering **Credits:** 0.00 to 18.00 - Electronics Packaging and Heterogeneous Integration
- MSE 50200 - Defects In Solids **Credits:** 3.00
- MSE 51000 - Microstructural Characterization Techniques **Credits:** 3.00
- MSE 52300 - Physical Ceramics **Credits:** 3.00
- MSE 54800 - Deposition Processing Of Thin Films And Coatings **Credits:** 3.00
- MSE 59700 - Selected Topics In Materials Engineering **Credits:** 0.00 to 18.00
  - Magnetic Materials: Physical Properties and Applications
  - Modeling & Simulation for Materials
  - Solid State Materials
- NUCL 42001 - Radiation Interaction With Materials And Applications **Credits:** 3.00
- NUCL 52000 - Radiation Effects And Reactor Materials **Credits:** 3.00
- NUCL 55300 - Nano-Macro Scale Applications Of Nuclear Technology **Credits:** 3.00

Integrated Circuit & System Design, Electronic Design Automation

- ECE 33700 - ASIC Design Laboratory **Credits:** 2.00
- ECE 36200 - Microprocessor Systems And Interfacing **Credits:** 4.00
- ECE 45500 - Integrated Circuit Engineering **Credits:** 3.00
- ECE 45600 - Digital Integrated Circuit Analysis And Design **Credits:** 3.00
- ECE 51220 - Applied Algorithms **Credits:** 3.00
- ECE 55900 - MOS VLSI Design **Credits:** 3.00
- ECE 56800 - Embedded Systems **Credits:** 3.00
- ECE 59500 - Selected Topics In Electrical Engineering **Credits:** 1.00 to 3.00
  - CMOS Analog IC Design
  - Computer Vision for Embedded Systems
  - Digital Systems Design Automation

Electronics Packaging, Heterogeneous Integration, and Thermal Management

- CHE 32000 - Statistical Modeling And Quality Enhancement **Credits:** 3.00

- ECE 59500 - Selected Topics In Electrical Engineering **Credits:** 1.00 to 3.00 - Introduction to Electronics Packaging and Heterogeneous Integration

Semiconductor Manufacturing and Global Supply Chain Management

- CHE 32000 - Statistical Modeling And Quality Enhancement **Credits:** 3.00
- IE 38600 - Work Analysis And Design I **Credits:** 3.00
- IE 48400 - Integrated Production Systems II **Credits:** 3.00
- IE 48600 - Work Analysis And Design II **Credits:** 3.00
- IE 49000 - Special Topics In Industrial Engineering **Credits:** 1.00 to 6.00 - Supply Chain Engineering
- IE 53200 - Reliability **Credits:** 3.00
- IE 53300 - Industrial Applications Of Statistics **Credits:** 3.00
- IE 55800 - Safety Engineering **Credits:** 3.00
- IE 56600 - Production Management Control **Credits:** 3.00
- IE 58200 - Advanced Facilities Design **Credits:** 3.00
- MGMT 26100 - Introduction To Supply Chain Management **Credits:** 3.00
- MGMT 40500 - Six Sigma And Quality Analytics **Credits:** 3.00
- MGMT 46200 - Advanced Manufacturing Planning And Control Systems **Credits:** 3.00
- MGMT 46300 - Supply Chain Analytics **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

Disclaimer

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Provost - Teaching and Learning

Certificate

Entrepreneurship and Innovation Certificate

PURPOSE
The Certificate in Entrepreneurship and Innovation Program empowers you to turn innovative ideas into action. In this flexible program designed to complement any major, you will:

- Learn how to evaluate and launch new venture opportunities

- Develop viable business models through market research and financial analyses

- Acquire the business literacy and professional skills demanded by today's employers

ELIGIBILITY

Simply enroll in the first introductory entrepreneurship course, ENTR 20000, and connect with your academic advisor. The program is open to all undergraduates enrolled at Purdue's West Lafyette campus who have approximately four semesters remaining in their academic programs.

BENEFITS

Upon completion, you receive an official certificate, which is noted on your academic transcript. This unique and multidisciplinary experience offers a number of benefits including:

- Professional skills for work and life
- Enhanced job prospects and choices

- Connections to entrepreneurs and innovators

- Workshops, speakers, and events

- Leadership and communication skills

- Unique and multidisciplinary experience

A PATHWAY FOR EVERY STUDENT

Designed with flexibility in mind, the approved course list is a comprehensive list of pre-approved option and capstone courses from all colleges to streamline and optimize your path for certificate completion. Your course pathway can be determined from courses in your major, or your intrests and career goals. Many courses fulfill both certificate and plan of study requirements in your major.

ABOUT US

Purdue's Certificate in Entrepreneurship and Innovation is one of the largest, multidisciplinary entrepreneurship programs in the country, serving thousands of students from across campus each year. Annually, hundreds of Purdue graduates receive their certificates in addition to their diplomas. The program is administered through Purdue's Office of the Provost and is located in the Burton D. Morgan Center for Entrepreneurship.

Visit our Website

Requirements

You must complete five courses in the following categories, *many of which may overlap with major requirements.*

Two Introductory Core Courses

Core courses provide you with the fundamental language, knowledge, leadership, and communication skills related to entrepreneurship and innovation. These required core courses are offered solely by the Certificate in Entrepreneurship and Innovation Program.

- ENTR 20000 - Introduction To Entrepreneurship And Innovation **Credits:** 3.00
  CHOOSE BETWEEN
- ENTR 31000 - Marketing And Management For New Ventures **Credits:** 3.00 - (residential and distance learning) or
- ENTR 31500 - Business Planning For Social Entrepreneurship **Credits:** 3.00 or
- ENTR 32500 - Global Entrepreneurship And Innovation **Credits:** 3.00

Two Option Courses

Option courses provide you with discipline or industry specific depth in areas which are relevant to entrepreneurship and innovation. They are offered through the Certificate in Entrepreneurship an Innovation Program as well as departments across the university.

Approved Option Courses

One Capstone Course

Capstone courses provide you with experiences which can include developing business plans for new ventures, consulting with small businesses or involvement in product innovation. They are offered through the Certificate in Entrepreneurship an Innovation Program as well as departments across the university.

Approved Capstone Courses

Notes

FOR MORE INFORMATION, PLEASE CONTACT:

Brenda Klinkhamer | Coordinating Academic Advisor | 765-496-7912 | bklink@purdue.edu

Nathalie Duval-Couetil | Director | 765-494-7068 | natduval@purdue.edu

Pre-Requisite Information

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

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Quantum Information Science and Technology Certificate

About the Program

The Certificate in Quantum Information Science & Technology (16 credits) will be jointly offered by the College of Science and the College of Engineering, and will be open to students in all undergraduate majors interested in careers in the field of quantum information science and technology. This certificate will give undergraduate students broad technical exposure to fundamental and applied topics related to QIST and is designed to supplement the baccalaureate plans of studies in different majors, including (but not limited to) engineering, computer science, physics, chemistry, math, and technology.

Requirements for the Certificate (16 credits)

Engineering Requirement (1 credit)

- ENGR 10301 - Introduction To Engineering In Practice **Credits:** 1.00 *Title: Introduction to Nano- and Quantum Technology*

QIST Introduction Courses (3-4 credits)

- PHYS 34400 - Introduction To Quantum Science **Credits:** 4.00

QIST Fundamental Courses (1-3 credits)

Choose one:

- ECE 39595 - Selected Topics In Electrical And Computer Engineering **Credits:** 1.00 to 5.00 *Title: Fundamentals of Quantum Technology*
- ECE 59500 - Selected Topics In Electrical Engineering **Credits:** 1.00 to 3.00
  Titles: Applied Quantum Computing I - Fundamentals; Introduction to Quantum Science and Technology
- 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

QIST Experience for Undergraduates Selectives (1-6 credits)

Choose 1-6 credits from courses below:

- PHYS 34000 - Modern Physics Laboratory **Credits:** 1.00
- Vertically Integrated Projects (VIP) courses or Research courses including relevant independent studies - Credit Hours: 1.00-6.00
- CHM 49900 - Special Assignments **Credits:** 1.00 to 5.00
- MA 29000 - Topics In Mathematics For Undergraduates **Credits:** 1.00 to 5.00
- MA 39000 - Topics In Mathematics For Undergraduates **Credits:** 1.00 to 5.00
- MA 49000 - Topics In Mathematics For Undergraduates **Credits:** 1.00 to 6.00
- PHYS 39000 - Special Assignments **Credits:** 1.00 to 4.00
- PHYS 49000 - Special Assignments **Credits:** 1.00 to 3.00
- PHYS 59000 - Reading And Research **Credits:** 1.00 to 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
- Full-time internship relevant to technical areas of QIST. Summer or semester-long of full-time internship, co-op, or summer undergraduate research fellowship (SURF), or similar experience is considered equivalent to 6 credit hours. (See advisor for courses that qualitfy) - Credit Hours: 1.00-6.00

Certificate Requirements

- Student must demonstrate a significant and meaningful experiential activity related to quantum information science. Examples include
- Internship with a company with responsibilities related to quantum information science. The internship should be full-time for a duration of 8-12 weeks, totaling 320+ hours of work experience. Students must register for a 0-credit internship course during their experience. The course requires student reflection and a performance evaluation completed by their supervisor.
- Full-time summer research experience related to quantum information science with a minimum duration of 8 weeks totaling 320 hours of work. Student must register for a 0-credit experiential learning course requiring reflection and a performance evaluation completed by their supervisor
- 6 credits of part-time research related to quantum information science
- 6 credits of study abroad with coursework related to quantum information science
- A combination of study abroad or part-time research related to quantum information science totaling 6 credits

*For 0-credit paid internships or research experiences, students will be asked to submit an offer letter to verify their experience dates, hours, and responsibilities.

Electives (2-10 credits)

Remaining credit hours must come from the courses below:

- CHM 37400 - Physical Chemistry II **Credits:** 3.00
- CS 48300 - Introduction To The Theory Of Computation **Credits:** 3.00
- CS 58400 - Theory Of Computation And Computational Complexity **Credits:** 3.00
- ECE 30653 - Introduction To Nanotechnology And Quantum Science & Technology **Credits:** 3.00
- ECE 39595 - Selected Topics In Electrical And Computer Engineering **Credits:** 1.00 to 5.00 *Title: Fundamentals of Quantum Technology*
- ECE 50631 - Fundamentals Of Current Flow **Credits:** 1.00
- ECE 50632 - Introduction To Quantum Transport **Credits:** 1.00

- ECE 50633 - Boltzmann Law: Physics To Computing **Credits:** 1.00
- ECE 55200 - Introduction To Lasers **Credits:** 3.00
- ECE 59500 - Selected Topics In Electrical Engineering **Credits:** 1.00 to 3.00 *Titles: Applied Quantum Computing I – Fundamentals; Applied Quantum Computing I – Fundamentals; Applied Quantum Computing III - Algorithm and Software; Intro to Electronics Packaging and Heterogeneous Integration; Introduction to Quantum Science and Technology; Microfabrication Fundamentals; Semiconductor Fundamentals; Semiconductor Manufacturing*
- ME 50100 - Statistical Thermodynamics **Credits:** 3.00
- ME 50300 - Micro-And-Nano-Scale Energy Transfer Processes **Credits:** 3.00
- MSE 50200 - Defects In Solids **Credits:** 3.00
- PHYS 36000 - Quantum Mechanics **Credits:** 3.00
- PHYS 46000 - Quantum Mechanics I Honors **Credits:** 3.00
- PHYS 46100 - Quantum Mechanics II Honors **Credits:** 3.00
- PHYS 52600 - Physics Of Quantum Computing And Quantum Information **Credits:** 3.00
- PHYS 54500 - Solid-State Physics **Credits:** 3.00
- PHYS 55000 - Introduction To Quantum Mechanics **Credits:** 3.00
- MA 51100 - Linear Algebra With Applications **Credits:** 3.00

Note

- Credit from only ONE of the following courses can be applied toward the total credit requirement of this certificate: PHYS 36000, PHYS 46000, ECE 39595: Fundamentals of Quantum Technology.
- QIST Experience for Undergraduates Selectives (1-6 credits) area will require advisor exceptions since courses are not listed by name.

Pre-Requisite Information

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

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Non-Degree

Entrepreneurship and Innovation Certificate Capstone Course List

Capstone courses provide students with projected-related experiences, which can include developing business plans for new ventures, consulting with small businesses or involvement in product innovation. They are offered through the Certificate in Entrepreneurship and Innovation Program as well as departments across the university.

- Courses designated "OPEN" on the list below are available to all students, where space permits and pre-requisites have been met.
- Course designated "RESTRICTED" on the list below may be limited by college, major, or other criteria and some may require departmental consent.

REQUIREMENTS

Students must complete ONE capstone course from the list of offerings below, some of which may overlap with requirements in their major.

Students are permitted to substitute an additional capstone for one of the required option courses. A grade of C- or higher is required for ENTR designated courses.

Certificate in Entrepreneurship and Innovation

OPEN
- ENTR 48000 - Entrepreneurial Leadership And Careers **Credits:** 3.00
- ENTR 48100 - Consulting For Emerging Enterprises **Credits:** 3.00
- ENTR 48200 - Venture Planning Studio **Credits:** 3.00
- ENTR 39699 - Internship And Research Experiences **Credits:** 0.00 - "I0" section only (Interns for Indiana, IFI)

Agriculture

OPEN
- AGEC 42700 - Advanced Agribusiness Marketing **Credits:** 3.00
- AGEC 42900 - Agri-Marketing Analytics **Credits:** 3.00
- AGEC 43000 - Agricultural And Food Business Strategy **Credits:** 3.00
- ASEC 43110 - International Engagement Methods **Credits:** 1.00 to 3.00
  RESTRICTED
- ASM 49400 - Project Planning And Management **Credits:** 1.00 Crosslisted with ABE 48400 - Title: Project Planning And Management
- ASM 49600 - Project Planning And Capstone Project **Credits:** 1.00 to 4.00
- FS 44300 - Food Product Design (Capstone) **Credits:** 3.00
- HORT 42700 - Horticulture Capstone **Credits:** 1.00
- ASM 49500 - Agricultural Systems Management Capstone Project **Credits:** 3.00 Crosslisted with ABE 48600 - Title: Agricultural Engineering Design

Education

Please refer to the Certificate in Entrepreneurship and Innovation Program, Agriculture, Engineering and Management capstone courses list as "OPEN" as well as the Experiential Programs, Research Courses and Study Abroad section.

Engineering

OPEN
- CE 59601 - Entrepreneurship And Business Strategy In Engineering **Credits:** 3.00
- CE 59801 - Breakthrough Thinking For Complex Challenges **Credits:** 3.00
- ENGR 49001 - Breakthrough Thinking For Complex Challenges **Credits:** 3.00
- EPCS 40200 - Senior Participation In EPICS **Credits:** 2.00

- EPCS 41200 - Senior Design Participation In EPICS **Credits:** 2.00
- 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

RESTRICTED
- AAE 45000 - Spacecraft Design **Credits:** 3.00
- AAE 45100 - Aircraft Design **Credits:** 3.00
- AAE 53500 - Propulsion Design, Build, Test **Credits:** 3.00
- ABE 48400 - Project Planning And Management **Credits:** 1.00
  - crosslisted with ASM - 49400 - Title: Project Planning And Management

- ABE 48500 - Agricultural Engineering Project Management And Design **Credits:** 4.00
- ABE 48600 - Agricultural Engineering Design **Credits:** 3.00 Crosslisted with ASM 49500 - Agricultural Systems Management Capstone Project
- ABE 55800 - Biological Engineering Design II **Credits:** 3.00
- BME 48901 - Senior Design Project Lab **Credits:** 3.00
- CHE 45000 - Design And Analysis Of Processing Systems **Credits:** 4.00
- ECE 47700 - Digital Systems Senior Project **Credits:** 4.00
- ECE 49022 - Electrical Engineering Senior Design Projects **Credits:** 4.00
- ECE 49595 - Selected Topics In Electrical And Computer Engineering **Credits:** 1.00 to 5.00 Title: Open Source Software
- IDE 48500 - Multidisciplinary Engineering Design Project **Credits:** 3.00
- EEE 48002 - Environmental And Ecological Engineering Senior Design II **Credits:** 2.00
- ME 46300 - Engineering Design **Credits:** 3.00
- MSE 44000 - Materials Processing And Design II **Credits:** 3.00
- NUCL 45000 - Design In Nuclear Engineering **Credits:** 3.00
- THTR 59700 - Production And Design Seminar **Credits:** 3.00 (must be taken twice)

Health and Human Sciences

RESTRICTED
- HTM 49901 - Strategic Management In Service Industries **Credits:** 3.00

Liberal Arts

OPEN
- COM 49101 - Boiler Communication **Credits:** 1.00

RESTRICTED
- FLM 49900 - Capstone In Film/Video/Media Production **Credits:** 2.00 or 4.00
- THTR 47902 - Capstone Project **Credits:** 3.00

Management

OPEN

- MGMT 48400 - Management Of Entrepreneurial Ventures **Credits:** 3.00

  RESTRICTED
- MGMT 49400 - IBE Capstone **Credits:** 3.00

Pharmacy

  RESTRICTED
- PHRM 86900 - Practice Management And Marketing Of Professional Services **Credits:** 2.00
- PHSC 46000 - Drug Discovery And Development I **Credits:** 3.00

Polytechnic Institute

  RESTRICTED
- AT 40900 - Advanced Air Mobility: Management And Operations **Credits:** 3.00
- CM 40000 - Construction Capstone I **Credits:** 6.00
- ENGT 48100 - Engineering Technology Capstone II **Credits:** 3.00

Science

  RESTRICTED
- CS 40700 - Software Engineering Senior Project **Credits:** 3.00
- CS 49000 - Topics In Computer Sciences For Undergraduates **Credits:** 1.00 to 5.00 Title: Data Science Capstone

Experiential Programs, Research Courses, and Study Abroad

  OPEN
- 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

Some entrepreneurial study abroad programs are approved to fulfill Certificate in Entrepreneurship and Innovation Program requirements. For a list of those opportunities, click here. If interested in these programs, please connect with the Certificate in Entrepreneurship and Innovation's academic advisor, Brenda Klinkhamer, at bklink@purdue.edu to obtain the necessary approval for it to be applied toward your certificate requirements.

Entrepreneurship and Innovation Certificate Option Course List

Option courses provide students with discipline or industry specific depth in areas that are relevant to entrepreneurship and innovation. They are offered through the Certificate in Entrepreneurship and Innovation Program as well as departments across the university.

- Courses designated "OPEN" on the list below are available to all students, where space permits and pre-requisites have been met.
- Course designated "RESTRICTED" on the list below may be limited by college, major, or other criteria and some may require departmental consent.

REQUIREMENTS

Students must complete TWO option courses from the list of offerings below, some of which may overlap with requirements in their major.

Students are permitted to substitute an additional capstone course for one of the required option courses. A grade of C- or higher is required for ENTR designated courses.

Certificate in Entrepreneurship and Innovation

OPEN
- ENTR 46000 - Internship And Career Preparation Seminar **Credits:** 1.00 (distance learning)
- ENTR 47000 - Gender, Diversity And Leadership **Credits:** 3.00 (spring only) Crosslisted with WGSS 39000 - same title
- ENTR 39699 - Internship And Research Experiences **Credits:** 0.00 - "D0" Sections Only (Discovery Undergraduate Interdisciplinary Research Internship, DUIRI)

College of Agriculture

OPEN
- AGEC 33000 - Management Methods For Agricultural Business **Credits:** 3.00
- AGEC 33100 - Principles Of Industrial Selling **Credits:** 3.00
- AGEC 42400 - Financial Management Of Agricultural Business **Credits:** 3.00
- AGEC 43100 - Advanced Industrial Sales And Marketing **Credits:** 4.00
- ASEC 28500 - Introduction To Publication Design **Credits:** 3.00
- ASEC 43100 - Planning For International Engagement Methods **Credits:** 1.00
- ASEC 43120 - Evaluating International Engagement Methods **Credits:** 1.00
- HORT 43500 - Developing An Agricultural Startup **Credits:** 4.00
  RESTRICTED
- ANSC 42500 - Ruminant Reproductive Farm Management **Credits:** 2.00
- ANSC 42600 - Non-ruminant Reproductive Farm Management **Credits:** 2.00
- ANSC 44000 - Horse Management **Credits:** 3.00
- ANSC 44200 - Sheep Management **Credits:** 3.00
- ANSC 44300 - Swine Management **Credits:** 3.00
- ANSC 48500 - Dairy Farm Evaluation **Credits:** 2.00
- ANSC 49500 - Special Topics In Animal Sciences **Credits:** 0.00 to 3.00 Title: Food Security and Environmental Challenges in Vietnam
- FS 49100 - Special Assignments In Food Science **Credits:** 1.00 to 3.00 Title: Boilermaker Sauces and Pickles Crosslisted with SFS 39100
- SFS 39100 - Special Problems In Sustainable Food And Farming Systems **Credits:** 1.00 to 3.00 Title: Boilermaker Sauces and Pickles Crosslisted with FS 49100
- Food Entrepreneurial and Manufacturing Institute (FEMI) - successful participation/completion of this program.

College of Education

- EDPS 30000 - Student Leadership Development **Credits:** 1.00 to 3.00

College of Engineering

- AAE 25100 - Introduction To Aerospace Design **Credits:** 3.00
- ABE 22600 - Biotechnology Laboratory I **Credits:** 2.00
- ABE 33000 - Design Of Machine Components **Credits:** 3.00
- CE 35500 - Engineering Environmental Sustainability **Credits:** 3.00 Crosslisted with EEE 35500 - Title: Project Planning And Management
- CE 49700 - Civil Engineering Projects **Credits:** 0.00 to 18.00 - Title: Ldrshp & Adv Proj Mgmt, Crosslisted with the following
- CE 59700 - Civil Engineering Projects **Credits:** 0.00 to 18.00 - Title: Ldrshp & Adv Proj Mgmt, Crosslisted with the following
- CEM 49700 - Construction Engineering Projects **Credits:** 0.00 to 4.00 - Title: Ldrshp & Adv Proj Mgmt
- CEM 59700 - Experimental Masters Course **Credits:** 1.00 to 3.00 -Title: Accounting and Finance for Managing Construction
- EEE 35500 - Engineering Environmental Sustainability **Credits:** 3.00 Crosslisted with CE 35500 - Title: Engineering Environmental Sustainability
- EEE 47200 - Community-Engaged Engineering & Design **Credits:** 3.00
- ENGR 30500 - Fundamentals Of Innovation Theory And Practice **Credits:** 3.00
- ENGR 39697 - Global Engineering Projects **Credits:** 1.00 to 3.00 - Title: Global Design Projects - Title: Learning While Working (LWW)
- ENGR 49600 - Experimental Courses **Credits:** 0.00 to 6.00 -Title: High Tech Entrepreneurship
- EPCS 10100 - First Year Participation In EPICS **Credits:** 1.00
- EPCS 10200 - First Year Participation In EPICS **Credits:** 2.00
- EPCS 11100 - First Year Participation In EPICS I **Credits:** 1.00
- EPCS 12100 - First Year Participation In EPICS II **Credits:** 1.00
- EPCS 20100 - Sophomore Participation In EPICS **Credits:** 1.00
- EPCS 20200 - Sophomore Participation In EPICS **Credits:** 2.00
- EPCS 30100 - Junior Participation In EPICS **Credits:** 1.00
- EPCS 30200 - Junior Participation In EPICS **Credits:** 2.00
- IDE 38500 - Design Methodologies For Diverse Stakeholders **Credits:** 3.00
- IE 34300 - Engineering Economics **Credits:** 3.00
- IE 54500 - Engineering Economic Analysis **Credits:** 3.00
- IE 54600 - Economic Decisions In Engineering **Credits:** 3.00
- IE 56600 - Production Management Control **Credits:** 3.00
- ME 49601 - Experimental Courses **Credits:** 1.00 to 6.00 - Title: Tools, Methods, and Techniques for Rapid, Iterative Product Design and Analysis
- ME 55400 - Intellectual Property For Engineers **Credits:** 1.00
- MSE 57400 - Sports Engineering And Entrepreneurship **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
  RESTRICTED
- AAE 35103 - Aerospace Systems Design **Credits:** 3.00
- AAE 41800 - Zero-Gravity Flight Experiment **Credits:** 3.00
- AAE 45400 - Design Of Aerospace Structures **Credits:** 3.00
- AAE 55100 - Design Theory And Methods For Aerospace Systems **Credits:** 3.00
- AAE 56000 - System-Of-Systems Modeling And Analysis **Credits:** 3.00
- AAE 58500 - Air Transportation Systems **Credits:** 3.00
- AAE 59000 - Projects In Aeronautical Engineering **Credits:** 1.00 to 6.00 - Title: Space Flight Operations
- ABE 55700 - Biological Engineering Design I **Credits:** 3.00
- BME 39000 - Professional Development And Design In Biomedical Engineering **Credits:** 2.00
- CHE 41200 - Chemical Engineering Design Research Problems **Credits:** 1.00 to 4.00
- ECE 20875 - Python For Data Science **Credits:** 3.00
- ECE 36200 - Microprocessor Systems And Interfacing **Credits:** 4.00
- ECE 49401 - Professional Communication Capstone **Credits:** 1.00
- ECE 49600 - Electrical And Computer Engineering Projects **Credits:** 0.00 to 18.00
- IDE 48300 - Multidisciplinary Engineering Analysis And Decision Making **Credits:** 1.00
- ME 26300 - Introduction To Mechanical Engineering Design, Innovation And Entrepreneurship **Credits:** 3.00
- ME 44400 - Computer-Aided Design And Prototyping **Credits:** 3.00
- ME 55300 - Product And Process Design **Credits:** 3.00
- NUCL 47000 - Fuel Cell Engineering **Credits:** 3.00
  "Entrepreneurial" Research in Materials Engineering - preapproved with MSE Department

College of Health and Human Sciences

  OPEN
- HDFS 34800 - Administration Of Social Service Not-For-Profit Organizations **Credits:** 3.00
- HK 32700 - Introduction To Sports Management **Credits:** 3.00
- HK 32800 - Business Of Professional Sports **Credits:** 3.00
- HK 42400 - Health And Fitness Program Management **Credits:** 3.00
- HK 42700 - Sports Marketing **Credits:** 3.00
- HK 42800 - Sports Facility And Event Management **Credits:** 3.00
- HSCI 22500 - Healthcare Leadership And Safety **Credits:** 3.00
- PSY 27200 - Introduction To Industrial-Organizational Psychology **Credits:** 3.00
  RESTRICTED
- CSR 30900 - Leadership Strategies **Credits:** 3.00
- CSR 34400 - Fundamentals Of Negotiations **Credits:** 3.00
- CSR 40600 - E-Retailing **Credits:** 3.00
- HTM 31200 - Talent Management For Service Industries **Credits:** 3.00
- HTM 34200 - Financial Management For Service Industries **Credits:** 3.00
- HTM 44100 - Financial Management For The Hospitality Industry **Credits:** 3.00
- NUR 41701 - Leadership In Nursing **Credits:** 3.00

- PSY 47300 - Selection And Performance Appraisal In Organizations **Credits:** 3.00
- PSY 47500 - Work Motivation And Job Satisfaction **Credits:** 3.00
- PUBH 32500 - Methods Of Health Promotion And Education **Credits:** 3.00

Honors College

- HONR 22200 - Solutions Lab Global **Credits:** 2.00
- HONR 29900 - Interdisciplinary Honors - Experiential Learning **Credits:** 1.00 to 6.00 - Title: High Tech Entrepreneurship - Title: Non-Profits and Philanthropy
- HONR 31300 - Science, Technology, & Society **Credits:** 3.00

College of Liberal Arts

OPEN
- AD 22800 - Visual Communication Design Computing I **Credits:** 3.00
- AMST 31000 - Invention, Innovation, And Design **Credits:** 3.00
- AMST 32500 - Sports, Technology, And Innovation **Credits:** 3.00
- ANTH 38400 - Designing For People: Anthropological Approaches **Credits:** 3.00 - Crosslisted with TECH 22000 and TLI 36700
- COM 21700 - Science Writing And Presentation **Credits:** 3.00
- COM 22400 - Communicating In The Global Workplace **Credits:** 3.00
- COM 31400 - Advanced Presentational Speaking **Credits:** 3.00
- COM 41900 - Judgment And Decision Making **Credits:** 3.00
- COM 43500 - Communication And Emerging Technologies **Credits:** 3.00
- COM 44400 - Introduction To Communication And Social Entrepreneurship **Credits:** 3.00
- COM 49503 - Public Relations For Social Change **Credits:** 3.00
- DANC 34500 - Choreography **Credits:** 3.00
- ENGL 42000 - Business Writing **Credits:** 3.00 - "E0" sections only (designated for Entrepreneurship Certificate)
- ENGL 43300 - Writing Proposals And Grants **Credits:** 3.00
- FR 22400 - Professional French I **Credits:** 3.00
- FR 32400 - Professional French II **Credits:** 3.00
- FR 42400 - Professional French III **Credits:** 3.00
- GER 22300 - German Level IV: Science And Engineering **Credits:** 3.00
- GER 22400 - German Level IV: Business German **Credits:** 3.00
- GER 32300 - German Level VI: Science And Engineering **Credits:** 3.00
- GER 42400 - Business German **Credits:** 3.00
- GER 52400 - German For International Trade **Credits:** 3.00
- IDIS 49000 - Directed Reading In Interdisciplinary Studies **Credits:** 1.00 to 3.00 - Title: International Internship (Lima, Peru or Seoul, South Korea)
- RUSS 42400 - Business Russian **Credits:** 3.00
- SPAN 22400 - Spanish Level IV: Business Spanish **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 32300 - Global Sustainable Engineering **Credits:** 1.00 to 3.00
- SPAN 32500 - Spanish For Engineering And Technology **Credits:** 3.00
- SPAN 42400 - Business Spanish **Credits:** 3.00
- SPAN 48500 - Food And Culture In The Hispanic World **Credits:** 3.00

- THTR 44000 - Directing: Page To Stage **Credits:** 3.00
- WGSS 39000 - Variable Topics In Women's, Gender And Sexuality Studies **Credits:** 1.00 to 4.00 - Title: Gender, Diversity and Leadership, Crosslisted with ENTR 47000 - same title
  RESTRICTED
- FLM 24100 - Foundations Of Cinema Production **Credits:** 3.00
- FLM 44600 - Producing Non-Fiction Video **Credits:** 3.00

School of Management

OPEN
- MGMT 25400 - Legal Foundations Of Business I **Credits:** 3.00
- MGMT 30400 - Introduction To Financial Management **Credits:** 3.00 - (non-mgmt students only)
- MGMT 39100 - Strategic Thinking And Decision-Making **Credits:** 3.00 - Crosslisted with TECH 34000 and TLI 46100
- MGMT 41350 - Venture Capital And Entrepreneurial Finance **Credits:** 3.00
- MGMT 44433 - Leading And Working In Teams **Credits:** 3.00
- MGMT 59000 - Directed Readings In Management **Credits:** 1.00 to 4.00 - Title: Student Managed Venture Fund
  RESTRICTED
- MGMT 11000 - Introduction To Management And Information Strategies **Credits:** 2.00
- MGMT 42000 - Consumer Analytics **Credits:** 3.00
- MGMT 42300 - New Product Development **Credits:** 3.00
- MGMT 42910 - Experiential Marketing **Credits:** 3.00
- MGMT 44710 - Competitive Strategy **Credits:** 3.00
- MGMT 44810 - Technology Strategy **Credits:** 3.00
- MGMT 45200 - Manufacturing Strategy And Process Innovation **Credits:** 3.00
- MGMT 48800 - Data-Driven Decisions In Digital Markets **Credits:** 3.00

College of Pharmacy

OPEN
- CLPH 45000 - Formulary Dossier Management **Credits:** 1.00
- PHRM 42700 - Conversations About Death And Dying **Credits:** 1.00
- PHRM 49000 - Special Topics **Credits:** 0.00 to 3.00 -Title: Intro to Leadership in Pharmacy Practice

RESTRICTED
- PHSC 46100 - Drug Discovery And Development II **Credits:** 3.00
- PHRM 83100 - Health Care Systems **Credits:** 2.00
- PHRM 84900 - Population Health Management **Credits:** 2.00
- PHRM 87000 - Health Policy Applications **Credits:** 1.00
- PHRM 87100 - Jurisprudence **Credits:** 2.00

Polytechnic Institute

OPEN
- IET 21400 - Introduction To Supply Chain Management Technology **Credits:** 3.00
- IET 23500 - Introduction To Systems Thinking And Process Improvement **Credits:** 3.00

- IET 33400 - Economic Analysis For Technology Systems **Credits:** 3.00
- IET 34300 - Technical And Service Selling **Credits:** 3.00
- IET 44275 - Global Transportation And Logistics Management **Credits:** 3.00
- TECH 22000 - Designing Technology For People **Credits:** 3.00 - Crosslisted with ANTH 38400 and TLI 36700
- TECH 34000 - Prototyping Technology For People **Credits:** 3.00 - Crosslisted with MGMT 39100 and TLI 46100
- TLI 36700 - Teaching Design And Innovation I **Credits:** 3.00 - Crosslisted with ANTH 38400 and TECH 22000
- TLI 46100 - Engineering/Technology Teacher Lab Planning **Credits:** 3.00 - Crosslisted with MGMT 39100 and TECH 34000
  RESTRICTED
- AT 41200 - Aviation Finance **Credits:** 3.00
- AT 49800 - Aviation Technology Capstone **Credits:** 3.00
- CGT 41201 - Contemporary Problems In Applied Computer Graphics II **Credits:** 2.00
- CM 45001 - Construction Capstone II **Credits:** 3.00
- CNIT 48000 - Managing Information Technology Projects **Credits:** 3.00
- TLI 31400 - Leading Innovation In Organizations **Credits:** 3.00
- TLI 31500 - New Product Development **Credits:** 3.00

College of Science

      OPEN
- COM 21700 - Science Writing And Presentation **Credits:** 3.00
- STAT 30301 - Probability And Statistics For Business **Credits:** 3.00
- All College of Science Core: Great Issues in Science courses
  RESTRICTED
- SCI 49000 - Topics In Science For Undergraduates **Credits:** 1.00 to 5.00 Title: Dean's Executive Forum

Experiential Programs, Research Courses, and Study Abroad

      OPEN
- ILS 38000 - Understanding Your Undergraduate Research Experience II **Credits:** 1.00 Crosslisted with the following
- GS 39501 - Understanding Your Undergraduate Research Experience II **Credits:** 1.00
  OR
- ILS 48000 - Beyond Undergraduate Research **Credits:** 1.00 Crosslisted with the following
- GS 49501 - Beyond Undergraduate Research **Credits:** 1.00
- ILS 49500 - Special Topics In Information And Data Science **Credits:** 1.00 to 4.00 - Title: Research Peer Mentoring Training
- ILS 59500 - Special Topics In Information And Data Science **Credits:** 1.00 to 4.00 - Title: Info Strat For Entr Innov
- 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

   RESTRICTED
- ILS 17500 - Information Strategies For Hospitality & Tourism Management **Credits:** 1.00

- Some entrepreneurial study abroad programs are approved to fulfill Certificate in Entrepreneurship and Innovation Program requirements. For a list of those opportunities, click here.
- If interested in these programs, please connect with the Certificate in Entrepreneurship and Innovation's academic advisor, Brenda Klinkhamer, bklink@purdue.edu to obtain the necessary approval for it to be applied toward your certificate requirements.

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Purdue Systems Collaboratory

See Systems Certificate for more information about the certificate.

Purdue Systems Collaboratory website

Certificate

Systems Certificate

About the Certificate

The purpose of the Certificate in Systems is to educate undergraduate students with a set of cognitive competencies, tools and methods that can be applied to a broad range of complex and challenging issues. The graduates of the program will be well prepared to create and execute transdisciplinary processes that result in systems responsive to stakeholders' needs. The program has three dimensions:

- Convergence of Knowledge: Students learn about foundational principles that span the different system domains, identifying common principles for systems, akin to the natural laws governing physical sciences. This is an essential step in furthering the ability to model, design, and manage complex systems.
- Human Dimension: Students practice advanced human-centric methods to build systems for large-scale societal applications, and methods to support decision-making for designing and operating complex systems.
- Systems Perspective: The certificate focus is on educating "systems thinkers". Students will be trained in liberal arts, mathematical concepts, the latest in computational architectures and tools, understanding human decision-making, policy, and exposed to the complexities of functioning in a globally distributed real- world enterprise.

Purdue Systems Collaboratory Website

Requirements for the Certificate (15 credits)

Required Courses (9 credits)

- SYS 30000 - It's A Complex World - Addressing Global Challenges **Credits:** 3.00 or
- SYS 50000 - Perspectives On Systems **Credits:** 3.00
- SYS 35000 - Systems Methods **Credits:** 3.00 or
- SYS 51000 - Tools And Methodologies For Designing Systems **Credits:** 3.00
- SYS 40000 - Systems Praxis **Credits:** 3.00 or
- SYS 53000 - Practical Systems Thinking **Credits:** 3.00

Supplemental Courses -Choose Two (6 credits)

See Systems Certificate Supplemental Courses List for courses.

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.

Non-Degree

Systems Certificate Supplemental Information

College of Agriculture

- ABE 48500 - Agricultural Engineering Project Management And Design **Credits:** 4.00
- AGEC 20400 - Introduction To Resource Economics And Environmental Policy **Credits:** 3.00
- AGEC 25000 - Economic Geography Of World Food And Resources **Credits:** 3.00
- AGEC 34000 - International Economic Development **Credits:** 3.00
- AGEC 35200 - Quantitative Techniques For Firm Decision Making **Credits:** 3.00
- AGEC 40600 - Natural Resource And Environmental Economics **Credits:** 3.00
- AGEC 41000 - Agricultural Policy **Credits:** 3.00
- AGEC 52500 - Environmental Policy Analysis **Credits:** 3.00
- AGEC 52800 - Global Change And The Challenge Of Sustainably Feeding A Growing Planet **Credits:** 3.00
- AGEC 59600 - Seminars In Current Issues In Agricultural Economics **Credits:** 1.00 to 3.00
- AGR 20100 - Communicating Across Culture **Credits:** 3.00
- AGRY 28500 - World Crop Adaptation And Distribution **Credits:** 3.00
- FNR 22310 - Introduction To Environmental Policy **Credits:** 3.00

- FNR 23000 - The World's Forests And Society **Credits:** 3.00
- FNR 30200 - Global Sustainability Issues **Credits:** 2.00
- FNR 40600 - Natural Resource And Environmental Economics **Credits:** 3.00
- SFS 31500 - Principles Of Permaculture **Credits:** 1.00

College of Education

- EDPS 31500 - Collaborative Leadership: Interpersonal Skills **Credits:** 3.00
- EDPS 31600 - Collaborative Leadership: Cross-Cultural Settings **Credits:** 3.00
- EDST 51200 - Foundations Of Educational Policy **Credits:** 3.00

College of Engineering

- AAE 25100 - Introduction To Aerospace Design **Credits:** 3.00
- AAE 55100 - Design Theory And Methods For Aerospace Systems **Credits:** 3.00
- AAE 56000 - System-Of-Systems Modeling And Analysis **Credits:** 3.00
- AAE 59000 - Projects In Aeronautical Engineering **Credits:** 1.00 to 6.00 (Title: Distributed Network Control)
- CE 35500 - Engineering Environmental Sustainability **Credits:** 3.00
- CE 39800 - Introduction To Civil Engineering Systems Design **Credits:** 3.00
- CE 49700 - Civil Engineering Projects **Credits:** 0.00 to 18.00 (Title: Modeling For Public Policy)
- CHE 46300 - Applications Of Chemical Engineering Principles **Credits:** 3.00
- EEE 25000 - Environmental, Ecological, and Engineering Systems **Credits:** 3.00
- EEE 30000 - Environmental And Ecological Systems Modeling **Credits:** 3.00
- EEE 35500 - Engineering Environmental Sustainability **Credits:** 3.00
- ENGR 30500 - Fundamentals Of Innovation Theory And Practice **Credits:** 3.00
- ENGR 31000 - Engineering In Global Context **Credits:** 3.00
- ENGR 39501 - Breakthrough Thinking Complex Challenges **Credits:** 3.00
- IDE 30100 - Professional Preparation In Interdisciplinary Engineering **Credits:** 1.00
- IE 33500 - Operations Research - Optimization **Credits:** 3.00
- IE 33600 - Operations Research - Stochastic Models **Credits:** 3.00
- IE 38300 - Integrated Production Systems I **Credits:** 3.00
- IE 38600 - Work Analysis And Design I **Credits:** 3.00
- IE 48100 - Introduction To System Simulation **Credits:** 3.00
- IE 52500 - Healthcare Delivery Systems **Credits:** 3.00
- IE 55800 - Safety Engineering **Credits:** 3.00
- IE 577 - Human Factors In Engineering **Credits:** 3.00
- IE 57900 - Design And Control Of Production And Manufacturing Systems **Credits:** 3.00
- IE 58000 - Systems Simulation **Credits:** 3.00
- ME 41500 - Energy Systems Engineering **Credits:** 3.00
- HIST 30000 - Eve Of Destruction: Global Crises And World Organization In The 20th Century **Credits:** 3.00
- PUBH 60100 - Introduction To The Quantitative Methods Of Public Health **Credits:** 3.00

College of Science

- BIOL 31200 - Great Issues Genomics And Society **Credits:** 3.00
- BIOL 44215 - Multidisciplinary Design Of Systems And Devices For Physiology Measurements **Credits:** 2.00

- BIOL 48300 - Great Issues: Environmental And Conservation Biology **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
- STAT 11300 - Statistics And Society **Credits:** 3.00

College of Health and Human Sciences

- CSR 34400 - Fundamentals Of Negotiations **Credits:** 3.00
- PUBH 60100 - Introduction To The Quantitative Methods Of Public Health **Credits:** 3.00
- NUR 22201 - Population Health **Credits:** 2.00
- PSY 24000 - Introduction To Social Psychology **Credits:** 3.00
- PSY 57700 - Human Factors In Engineering **Credits:** 3.00

Krannert School of Management

- ECON 36100 - Antitrust And Regulation **Credits:** 3.00
- ECON 36700 - Law And Economics **Credits:** 3.00
- ECON 45100 - Game Theory **Credits:** 3.00
- ECON 47100 - Behavioral Economics **Credits:** 3.00
- ECON 48500 - Economics Of Racial And Gender Discrimination **Credits:** 3.00

College of Liberal Arts

- ANTH 21000 - Technology And Culture **Credits:** 3.00
- ANTH 32700 - Environment And Culture **Credits:** 3.00
- ANTH 34000 - Global Perspectives On Health **Credits:** 3.00
- ANTH 37000 - Ethnicity And Culture **Credits:** 3.00
- COM 20400 - Critical Perspectives On Communication **Credits:** 3.00
- COM 22400 - Communicating In The Global Workplace **Credits:** 3.00
- COM 25100 - Communication, Information, And Society **Credits:** 3.00
- COM 30300 - Intercultural Communication **Credits:** 3.00
- COM 32400 - Introduction To Organizational Communication **Credits:** 3.00
- COM 35300 - Problems In Public Relations **Credits:** 3.00
- COM 41100 - Communication And Social Networks **Credits:** 3.00
- COM 44400 - Introduction To Communication And Social Entrepreneurship **Credits:** 3.00
- GSLA 10100 - Global Awareness **Credits:** 3.00
- HIST 10500 - Survey Of Global History **Credits:** 3.00
- HIST 30000 - Eve Of Destruction: Global Crises And World Organization In The 20th Century **Credits:** 3.00
- HIST 38700 - History Of The Space Age **Credits:** 3.00
- PHIL 11400 - Global Moral Issues **Credits:** 3.00
- POL 12000 - Introduction To Public Policy And Public Administration **Credits:** 3.00
- POL 14100 - Governments Of The World **Credits:** 3.00
- POL 22300 - Introduction To Environmental Policy **Credits:** 3.00

- POL 32300 - Comparative Environmental Policy **Credits:** 3.00
- POL 32700 - Global Green Politics **Credits:** 3.00
- POL 34700 - Introduction To Latin American Politics **Credits:** 3.00
- POL 41300 - Analysis Of Political Attitudes And Behavior **Credits:** 3.00
- POL 42900 - Contemporary Political Problems **Credits:** 3.00
- SOC 22000 - Social Problems **Credits:** 3.00
- SOC 35200 - Drugs, Culture, And Society **Credits:** 3.00

Polytechnic Institute

- AT 42101 - Managerial Economics In Aviation **Credits:** 3.00
- AT 45400 - Human Factors In Aviation **Credits:** 3.00
- AT 52500 - Process Improvement And Simulation **Credits:** 3.00
- AT 55000 - Critical Systems Thinking **Credits:** 3.00
- BCM 34000 - Introduction To Healthcare Construction Management **Credits:** 3.00
- CGT 17208 - User Experience Design Studio I: Fundamentals **Credits:** 3.00
- CNIT 18200 - System And Organizational Security **Credits:** 3.00
- CNIT 28000 - Systems Analysis And Design Methods **Credits:** 3.00
- CNIT 32000 - Policy, Regulation, And Globalization In Information Technology **Credits:** 3.00
- CNIT 48000 - Managing Information Technology Projects **Credits:** 3.00
- MA 27900 - Modern Mathematics In Science And Society **Credits:** 3.00
- OLS 34500 - Critical Thinking In Organizations **Credits:** 3.00
- OLS 34600 - Critical Thinking And Ethics **Credits:** 3.00
- TECH 12000 - Design Thinking In Technology **Credits:** 3.00
- TLI 45570 - Global Human Resources **Credits:** 3.00

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Office of Professional Practice

Professional Practice Programs

Purdue's Office of Professional Practice (OPP) offers work-integrated learning experiences and provides students an advantage in career readiness with course work and hands-on learning/training during their time at Purdue. OPP supports students within the academic environment of the institution and its global partners, participates in academic research within the field of professional practice and assists academic units with enhanced employer engagement. Committed to fostering a holistic student experience, OPP offers formal programs in Co-op, internship and research formats. OPP also facilitates the Global Engineering Alliance for Research and Education (GEARE), Purdue's premier international work experience program. Purdue designs Professional Practice programs to combine practical on-the-job experiences with the classroom training of a four-year college curriculum.

Extensive Industry Co-op Certificate
The extensive Industry Co-op Certificate is awarded to students who have gained 18 months or more of full-time work experience related to their academic field of study. Students will register for a cooperative education course during each academic term for which they are engaged in full-time work with an employer. Students are required to complete five work

terms. Students should have a progressive experience, with multiple work terms occurring at the same employer. Students may change employers one time. Students must complete all necessary requirements specific to their academic discipline.

<u>Industry Co-op Certificate</u>
The Industry Co-op Certificate is awarded to students who have gained about one year of full-time work (at least one fall/spring semester) experience related to their academic field of study. Students will register for a cooperative education course during each academic term for which they are engaged in full-time work with an employer. Students are required to complete a minimum of three work terms. Students should have a progressive experience, with a minimum of two work terms occurring with the same employer. Students must complete all necessary requirements specific to their academic discipline.

Message from the Director

Office of Professional Practice Website

Program Information

Program Availability by Discipline

Undergraduate Co-op Program

Master's Co-op Program

GEARE Program

Learning While Working

Milestones Technical Courses

Interns for Indiana

Contact Us

Have questions? Email us at propractice@purdue.edu to schedule an appointment.

Office of Professional Practice

Potter Engineering Center, Rm. 114

500 Central Drive

West Lafayette, IN 47907

Phone: (765) 494-7430

Email: propractice@purdue.edu

Certificate

Extensive Industry Co-op Certificate

About the Certificate

The extensive Industry Co-op Certificate is awarded to students who have gained 18 months or more of full-time work experience related to their academic field of study. Students will register for a cooperative education course during each academic term for which they are engaged in full-time work with an employer. Students are required to complete five work terms. Students should have a progressive experience, with multiple work terms occurring at the same employer. Students may change employers one time. Students must complete all necessary requirements specific to their academic discipline.

Course Requirement

Five sequential courses with the same prefix must be taken to complete the Extensive Industry Co-op Program Certificate.

College of Agriculture

- AGEC 29199 - Cooperative Experience I **Credits:** 0.00
- AGEC 29299 - Cooperative Experience II **Credits:** 0.00
- AGEC 39399 - Cooperative Experience III **Credits:** 0.00
- AGEC 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- AGEC 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- AGR 29199 - Cooperative Experience I **Credits:** 0.00
- AGR 29299 - Cooperative Experience II **Credits:** 0.00
- AGR 39399 - Cooperative Experience III **Credits:** 0.00
- AGR 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- AGR 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- AGRY 29199 - Cooperative Experience I **Credits:** 0.00
- AGRY 29299 - Cooperative Experience II **Credits:** 0.00
- AGRY 39399 - Cooperative Experience III **Credits:** 0.00
- AGRY 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- AGRY 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ASM 29199 - Cooperative Experience I **Credits:** 0.00
- ASM 29299 - Cooperative Experience II **Credits:** 0.00
- ASM 39399 - Cooperative Experience III **Credits:** 0.00
- ASM 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ASM 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ENTM 29199 - Cooperative Experience I **Credits:** 0.00
- ENTM 29299 - Cooperative Experience II **Credits:** 0.00
- ENTM 39399 - Cooperative Experience III **Credits:** 0.00
- ENTM 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ENTM 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- FNR 29199 - Cooperative Experience I **Credits:** 0.00
- FNR 29299 - Cooperative Experience II **Credits:** 0.00
- FNR 39399 - Cooperative Experience III **Credits:** 0.00

- FNR 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- FNR 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- FS 29199 - Cooperative Experience I **Credits:** 0.00
- FS 29299 - Cooperative Experience II **Credits:** 0.00
- FS 39399 - Cooperative Experience III **Credits:** 0.00
- FS 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- FS 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- HORT 29199 - Cooperative Experience I **Credits:** 0.00
- HORT 29299 - Cooperative Experience II **Credits:** 0.00
- HORT 39399 - Cooperative Experience III **Credits:** 0.00
- HORT 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- HORT 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- LA 29199 - Cooperative Experience I **Credits:** 0.00
- LA 29299 - Cooperative Experience II **Credits:** 0.00
- LA 39399 - Cooperative Experience III **Credits:** 0.00
- LA 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- LA 39599 - Extensive Cooperative Experience V **Credits:** 0.00

College of Engineering

- AAE 29199 - Cooperative Experience I **Credits:** 0.00
- AAE 29299 - Cooperative Experience II **Credits:** 0.00
- AAE 39399 - Cooperative Experience III **Credits:** 0.00
- AAE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- AAE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ABE 29199 - Cooperative Experience I **Credits:** 0.00
- ABE 29299 - Cooperative Experience II **Credits:** 0.00
- ABE 39399 - Cooperative Experience III **Credits:** 0.00
- ABE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ABE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- BME 29199 - Cooperative Experience I **Credits:** 0.00
- BME 29299 - Cooperative Experience II **Credits:** 0.00
- BME 39399 - Cooperative Experience III **Credits:** 0.00
- BME 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- BME 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- CE 29199 - Cooperative Experience I **Credits:** 0.00
- CE 29299 - Cooperative Experience II **Credits:** 0.00
- CE 39399 - Cooperative Experience III **Credits:** 0.00
- CE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- CE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- CHE 29199 - Cooperative Experience I **Credits:** 0.00
- CHE 29299 - Cooperative Experience II **Credits:** 0.00
- CHE 39399 - Cooperative Experience III **Credits:** 0.00
- CHE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- CHE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ECE 29199 - Cooperative Experience I **Credits:** 0.00
- ECE 29299 - Cooperative Experience II **Credits:** 0.00

- ECE 39399 - Cooperative Experience III **Credits:** 0.00
- ECE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ECE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- EEE 29199 - Cooperative Experience I **Credits:** 0.00
- EEE 29299 - Cooperative Experience II **Credits:** 0.00
- EEE 39399 - Cooperative Experience III **Credits:** 0.00
- EEE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- EEE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ENGR 29199 - Cooperative Experience I **Credits:** 0.00
- ENGR 29299 - Cooperative Experience II **Credits:** 0.00
- ENGR 39399 - Cooperative Experience III **Credits:** 0.00
- ENGR 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ENGR 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- IDE 29199 - Cooperative Experience I **Credits:** 0.00
- IDE 29299 - Cooperative Experience II **Credits:** 0.00
- IDE 39399 - Cooperative Experience III **Credits:** 0.00
- IDE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- IDE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- IE 29199 - Cooperative Experience I **Credits:** 0.00
- IE 29299 - Cooperative Experience II **Credits:** 0.00
- IE 39399 - Cooperative Experience III **Credits:** 0.00
- IE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- IE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- ME 29199 - Cooperative Experience I **Credits:** 0.00
- ME 29299 - Cooperative Experience II **Credits:** 0.00
- ME 39399 - Cooperative Experience III **Credits:** 0.00
- ME 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ME 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- MSE 29199 - Cooperative Experience I **Credits:** 0.00
- MSE 29299 - Cooperative Experience II **Credits:** 0.00
- MSE 39399 - Cooperative Experience III **Credits:** 0.00
- MSE 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- MSE 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- NUCL 29199 - Cooperative Experience I **Credits:** 0.00
- NUCL 29299 - Cooperative Experience II **Credits:** 0.00
- NUCL 39399 - Cooperative Experience III **Credits:** 0.00
- NUCL 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- NUCL 39599 - Extensive Cooperative Experience V **Credits:** 0.00

College of Health and Human Sciences

- NUR 29199 - Cooperative Experience I **Credits:** 0.00
- NUR 29299 - Cooperative Experience II **Credits:** 0.00
- NUR 39399 - Cooperative Experience III **Credits:** 0.00
- NUR 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- NUR 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- PSY 29199 - Cooperative Experience I **Credits:** 0.00

- PSY 29299 - Cooperative Experience II **Credits:** 0.00
- PSY 39399 - Cooperative Experience III **Credits:** 0.00
- PSY 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- PSY 39599 - Extensive Cooperative Experience V **Credits:** 0.00

College of Liberal Arts

- AD 29199 - Cooperative Experience I **Credits:** 0.00
- AD 29299 - Cooperative Experience II **Credits:** 0.00
- AD 39399 - Cooperative Experience III **Credits:** 0.00
- AD 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- AD 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- COM 29199 - Cooperative Experience I **Credits:** 0.00
- COM 29299 - Cooperative Experience II **Credits:** 0.00
- COM 39399 - Cooperative Experience III **Credits:** 0.00
- COM 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- COM 39599 - Extensive Cooperative Experience V **Credits:** 0.00

School of Management

- ECON 29199 - Cooperative Experience I **Credits:** 0.00
- ECON 29299 - Cooperative Experience II **Credits:** 0.00
- ECON 39399 - Cooperative Experience III **Credits:** 0.00
- ECON 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- ECON 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- MGMT 29199 - Cooperative Experience I **Credits:** 0.00
- MGMT 29299 - Cooperative Experience II **Credits:** 0.00
- MGMT 39399 - Cooperative Experience III **Credits:** 0.00
- MGMT 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- MGMT 39599 - Extensive Cooperative Experience V **Credits:** 0.00

College of Pharmacy

- PHRM 29199 - Cooperative Experience I **Credits:** 0.00
- PHRM 29299 - Cooperative Experience II **Credits:** 0.00
- PHRM 39399 - Cooperative Experience III **Credits:** 0.00
- PHRM 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- PHRM 39599 - Extensive Cooperative Experience V **Credits:** 0.00

Polytechnic Institute

- TECH 29199 - Cooperative Experience I **Credits:** 0.00
- TECH 29299 - Cooperative Experience II **Credits:** 0.00
- TECH 39399 - Cooperative Experience III **Credits:** 0.00
- TECH 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- TECH 39599 - Extensive Cooperative Experience V **Credits:** 0.00

College of Science

- CHM 29199 - Cooperative Experience I **Credits:** 0.00
- CHM 29299 - Cooperative Experience II **Credits:** 0.00
- CHM 39399 - Cooperative Experience III **Credits:** 0.00
- CHM 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- CHM 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- CS 29199 - Cooperative Experience I **Credits:** 0.00
- CS 29299 - Cooperative Experience II **Credits:** 0.00
- CS 39399 - Cooperative Experience III **Credits:** 0.00
- CS 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- CS 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- MA 29199 - Cooperative Experience I **Credits:** 0.00
- MA 29299 - Cooperative Experience II **Credits:** 0.00
- MA 39399 - Cooperative Experience III **Credits:** 0.00
- MA 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- MA 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- PHYS 29199 - Cooperative Experience I **Credits:** 0.00
- PHYS 29299 - Cooperative Experience II **Credits:** 0.00
- PHYS 39399 - Cooperative Experience III **Credits:** 0.00
- PHYS 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- PHYS 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- SCI 29199 - Cooperative Experience I **Credits:** 0.00
- SCI 29299 - Cooperative Experience II **Credits:** 0.00
- SCI 39399 - Cooperative Experience III **Credits:** 0.00
- SCI 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- SCI 39599 - Extensive Cooperative Experience V **Credits:** 0.00
- STAT 29199 - Cooperative Experience I **Credits:** 0.00
- STAT 29299 - Cooperative Experience II **Credits:** 0.00
- STAT 39399 - Cooperative Experience III **Credits:** 0.00
- STAT 39499 - Extensive Cooperative Experience IV **Credits:** 0.00
- STAT 39599 - Extensive Cooperative Experience V **Credits:** 0.00

Additional Courses:

Any course below can substitute for a co-op course in a sequence above.

Course Number 39699 (may choose one)
- AAE 39699 - Professional Practice Internship **Credits:** 0.00
- ABE 39699 - Professional Practice Internship **Credits:** 0.00
- BIOL 39699 - Professional Practice Internship **Credits:** 0.00
- BME 39699 - Professional Practice Internship **Credits:** 0.00
- CE 39699 - Professional Practice Internship **Credits:** 0.00
- CHE 39699 - Professional Practice Internship **Credits:** 0.00
- CHM 39699 - Professional Practice Internship **Credits:** 0.00
- ECE 39699 - Professional Practice Internship **Credits:** 0.00
- EEE 39699 - Professional Practice Internship **Credits:** 0.00

- ENGR 39699 - Professional Practice Internship **Credits:** 0.00
- ENTR 39699 - Internship And Research Experiences **Credits:** 0.00
- IDE 39699 - Professional Practice Internship **Credits:** 0.00
- IE 39699 - Professional Practice Internship **Credits:** 0.00
- ME 39699 - Professional Practice Internship **Credits:** 0.00
- MSE 39699 - Professional Practice Internship **Credits:** 0.00
- NUCL 39699 - Professional Practice Internship **Credits:** 0.00
- NUR 39699 - Professional Practice Internship **Credits:** 0.00
- TECH 39699 - Professional Practice Internship **Credits:** 0.00 to 3.00
  Course Number 39799
- ENGR 39799 - GEARE Domestic Internship **Credits:** 0.00
  Course Number 39899
- ENGR 39899 - GEARE Global Internship **Credits:** 0.00

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.

Industry Co-op Certificate

About the Certificate

The Industry Co-op Certificate is awarded to students who have gained about one year of full-time work (at least one fall/spring semester) experience related to their academic field of study. Students will register for a cooperative education course during each academic term for which they are engaged in full-time work with an employer. Students are required to complete a minimum of three work terms. Students should have a progressive experience, with a minimum of two work terms occurring with the same employer. Students must complete all necessary requirements specific to their academic discipline.

Course Requirements (3 course sequence)

Three sequential courses with the same prefix must be taken to complete the Industry Co-op Program Certificate.

College of Agriculture
- AGEC 29199 - Cooperative Experience I **Credits:** 0.00
- AGEC 29299 - Cooperative Experience II **Credits:** 0.00
- AGEC 39399 - Cooperative Experience III **Credits:** 0.00
- AGR 29199 - Cooperative Experience I **Credits:** 0.00
- AGR 29299 - Cooperative Experience II **Credits:** 0.00
- AGR 39399 - Cooperative Experience III **Credits:** 0.00
- AGRY 29199 - Cooperative Experience I **Credits:** 0.00
- AGRY 29299 - Cooperative Experience II **Credits:** 0.00
- AGRY 39399 - Cooperative Experience III **Credits:** 0.00

- ASM 29199 - Cooperative Experience I **Credits:** 0.00
- ASM 29299 - Cooperative Experience II **Credits:** 0.00
- ASM 39399 - Cooperative Experience III **Credits:** 0.00
- ENTM 29199 - Cooperative Experience I **Credits:** 0.00
- ENTM 29299 - Cooperative Experience II **Credits:** 0.00
- ENTM 39399 - Cooperative Experience III **Credits:** 0.00
- FNR 29199 - Cooperative Experience I **Credits:** 0.00
- FNR 29299 - Cooperative Experience II **Credits:** 0.00
- FNR 39399 - Cooperative Experience III **Credits:** 0.00
- FS 29199 - Cooperative Experience I **Credits:** 0.00
- FS 29299 - Cooperative Experience II **Credits:** 0.00
- FS 39399 - Cooperative Experience III **Credits:** 0.00
- HORT 29199 - Cooperative Experience I **Credits:** 0.00
- HORT 29299 - Cooperative Experience II **Credits:** 0.00
- HORT 39399 - Cooperative Experience III **Credits:** 0.00
- LA 29199 - Cooperative Experience I **Credits:** 0.00
- LA 29299 - Cooperative Experience II **Credits:** 0.00
- LA 39399 - Cooperative Experience III **Credits:** 0.00
- **College of Engineering**
- AAE 29199 - Cooperative Experience I **Credits:** 0.00
- AAE 29299 - Cooperative Experience II **Credits:** 0.00
- AAE 39399 - Cooperative Experience III **Credits:** 0.00
- ABE 29199 - Cooperative Experience I **Credits:** 0.00
- ABE 29299 - Cooperative Experience II **Credits:** 0.00
- ABE 39399 - Cooperative Experience III **Credits:** 0.00
- BME 29199 - Cooperative Experience I **Credits:** 0.00
- BME 29299 - Cooperative Experience II **Credits:** 0.00
- BME 39399 - Cooperative Experience III **Credits:** 0.00
- CE 29199 - Cooperative Experience I **Credits:** 0.00
- CE 29299 - Cooperative Experience II **Credits:** 0.00
- CE 39399 - Cooperative Experience III **Credits:** 0.00
- CHE 29199 - Cooperative Experience I **Credits:** 0.00
- CHE 29299 - Cooperative Experience II **Credits:** 0.00
- CHE 39399 - Cooperative Experience III **Credits:** 0.00
- ECE 29199 - Cooperative Experience I **Credits:** 0.00
- ECE 29299 - Cooperative Experience II **Credits:** 0.00
- ECE 39399 - Cooperative Experience III **Credits:** 0.00
- EEE 29199 - Cooperative Experience I **Credits:** 0.00
- EEE 29299 - Cooperative Experience II **Credits:** 0.00
- EEE 39399 - Cooperative Experience III **Credits:** 0.00
- ENGR 29199 - Cooperative Experience I **Credits:** 0.00
- ENGR 29299 - Cooperative Experience II **Credits:** 0.00
- ENGR 39399 - Cooperative Experience III **Credits:** 0.00
- IDE 29199 - Cooperative Experience I **Credits:** 0.00
- IDE 29299 - Cooperative Experience II **Credits:** 0.00
- IDE 39399 - Cooperative Experience III **Credits:** 0.00
- IE 29199 - Cooperative Experience I **Credits:** 0.00
- IE 29299 - Cooperative Experience II **Credits:** 0.00

- IE 39399 - Cooperative Experience III **Credits:** 0.00
- ME 29199 - Cooperative Experience I **Credits:** 0.00
- ME 29299 - Cooperative Experience II **Credits:** 0.00
- ME 39399 - Cooperative Experience III **Credits:** 0.00
- MSE 29199 - Cooperative Experience I **Credits:** 0.00
- MSE 29299 - Cooperative Experience II **Credits:** 0.00
- MSE 39399 - Cooperative Experience III **Credits:** 0.00
- NUCL 29199 - Cooperative Experience I **Credits:** 0.00
- NUCL 29299 - Cooperative Experience II **Credits:** 0.00
- NUCL 39399 - Cooperative Experience III **Credits:** 0.00
  College of Health and Human Sciences
- NUR 29199 - Cooperative Experience I **Credits:** 0.00
- NUR 29299 - Cooperative Experience II **Credits:** 0.00
- NUR 39399 - Cooperative Experience III **Credits:** 0.00
- PSY 29199 - Cooperative Experience I **Credits:** 0.00
- PSY 29299 - Cooperative Experience II **Credits:** 0.00
- PSY 39399 - Cooperative Experience III **Credits:** 0.00
  College of Liberal Arts
- AD 29199 - Cooperative Experience I **Credits:** 0.00
- AD 29299 - Cooperative Experience II **Credits:** 0.00
- AD 39399 - Cooperative Experience III **Credits:** 0.00
- COM 29199 - Cooperative Experience I **Credits:** 0.00
- COM 29299 - Cooperative Experience II **Credits:** 0.00
- COM 39399 - Cooperative Experience III **Credits:** 0.00
  School of Management
- ECON 29199 - Cooperative Experience I **Credits:** 0.00
- ECON 29299 - Cooperative Experience II **Credits:** 0.00
- ECON 39399 - Cooperative Experience III **Credits:** 0.00
- MGMT 29199 - Cooperative Experience I **Credits:** 0.00
- MGMT 29299 - Cooperative Experience II **Credits:** 0.00
- MGMT 39399 - Cooperative Experience III **Credits:** 0.00
  College of Pharmacy
- PHRM 29199 - Cooperative Experience I **Credits:** 0.00
- PHRM 29299 - Cooperative Experience II **Credits:** 0.00
- PHRM 39399 - Cooperative Experience III **Credits:** 0.00
  Polytechnic Institute
- TECH 29199 - Cooperative Experience I **Credits:** 0.00
- TECH 29299 - Cooperative Experience II **Credits:** 0.00
- TECH 39399 - Cooperative Experience III **Credits:** 0.00
  College of Science
- CHM 29199 - Cooperative Experience I **Credits:** 0.00
- CHM 29299 - Cooperative Experience II **Credits:** 0.00
- CHM 39399 - Cooperative Experience III **Credits:** 0.00
- CS 29199 - Cooperative Experience I **Credits:** 0.00
- CS 29299 - Cooperative Experience II **Credits:** 0.00
- CS 39399 - Cooperative Experience III **Credits:** 0.00
- MA 29199 - Cooperative Experience I **Credits:** 0.00
- MA 29299 - Cooperative Experience II **Credits:** 0.00

- MA 39399 - Cooperative Experience III **Credits:** 0.00
- PHYS 29199 - Cooperative Experience I **Credits:** 0.00
- PHYS 29299 - Cooperative Experience II **Credits:** 0.00
- PHYS 39399 - Cooperative Experience III **Credits:** 0.00
- SCI 29199 - Cooperative Experience I **Credits:** 0.00
- SCI 29299 - Cooperative Experience II **Credits:** 0.00
- SCI 39399 - Cooperative Experience III **Credits:** 0.00
- STAT 29199 - Cooperative Experience I **Credits:** 0.00
- STAT 29299 - Cooperative Experience II **Credits:** 0.00
- STAT 39399 - Cooperative Experience III **Credits:** 0.00

Additional Courses:

Any course below can substitute for a co-op course in a sequence above.

Course Number 39699 (may choose one)
- AAE 39699 - Professional Practice Internship **Credits:** 0.00
- ABE 39699 - Professional Practice Internship **Credits:** 0.00
- BIOL 39699 - Professional Practice Internship **Credits:** 0.00
- BME 39699 - Professional Practice Internship **Credits:** 0.00
- CE 39699 - Professional Practice Internship **Credits:** 0.00
- CHE 39699 - Professional Practice Internship **Credits:** 0.00
- CHM 39699 - Professional Practice Internship **Credits:** 0.00
- ECE 39699 - Professional Practice Internship **Credits:** 0.00
- EEE 39699 - Professional Practice Internship **Credits:** 0.00
- ENGR 39699 - Professional Practice Internship **Credits:** 0.00
- ENTR 39699 - Internship And Research Experiences **Credits:** 0.00
- IDE 39699 - Professional Practice Internship **Credits:** 0.00
- IE 39699 - Professional Practice Internship **Credits:** 0.00
- ME 39699 - Professional Practice Internship **Credits:** 0.00
- MSE 39699 - Professional Practice Internship **Credits:** 0.00
- NUCL 39699 - Professional Practice Internship **Credits:** 0.00
- NUR 39699 - Professional Practice Internship **Credits:** 0.00
- TECH 39699 - Professional Practice Internship **Credits:** 0.00 to 3.00
  Course Number 39799
- ENGR 39799 - GEARE Domestic Internship **Credits:** 0.00
  Course Number 39899
- ENGR 39899 - GEARE Global Internship **Credits:** 0.00

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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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Pharmaceutical Manufacturing Certificate

About the Certificate

The Certificate in Pharmaceutical Manufacturing (16 credits) is open to undergraduate students interested in careers in the pharmaceutical industry, especially within the manufacturing and supply chain sectors. The certificate is designed to supplement the baccalaureate plans of studies in different majors, including (but not limited to) engineering, computer science, chemistry, biology, pharmaceutical sciences, health sciences, technology, and business, chemistry, biology, pharmaceutical sciences, and health sciences. The pharmaceutical and life sciences industry talent needs are shifting driven by the new therapeutic product modalities (e.g., cell and gene therapies), digitization, and advanced data analytics. The technological disruptors are creating a skill mismatch between the traditional degrees associated with the pharmaceutical sector and future demands. By 2030 a projected 90,000 current jobs in the pharma industry will disappear due to automation while up to 120,000 of different jobs in high-skilled occupations will be created. Purdue University has gained an understanding of the industry's needs through collaboration with Work Force of the Future initiative, sponsored by the ISPE Global Pharmaceutical Manufacturing Leadership Forum, and partnerships with major regional life sciences industry employers such as Eli Lilly. While the degrees most associated with this sector (chemistry, chemical engineering, and pharmaceutical sciences) will continue to be valuable, the disciplines of data science, artificial intelligence, mechanical engineering, biomedical engineering, industrial engineering, as well as robotics and automation technologies will play significant roles within these organizations. Graduates of such programs currently have limited exposure to drug development and regulatory process required to ensure public safety. The undergraduate certificate provides broad technical exposure to these topics through relevant courses and experiential learning opportunities. Combined with their Purdue major plans of study, students who attain this certificate will be well positioned to advance into successful careers working in the global pharmaceutical industry. Clinical exposure to these topics through relevant courses and experiential learning opportunities. Combined with their Purdue major plans of study, students who attain this certificate will be well positioned to advance into successful careers working in the global pharmaceutical industry.

Requirements for the Certificate (10 credits)

Required Courses (1 credits)

At least 1 credit hour of orientation seminar from the course list below.

- ENGR 10301 - Introduction To Engineering In Practice **Credits:** 1.00

Experiential Learning in Pharmaceutical Manufacturing

- Full-time internship or co-op in areas relevant to pharmaceutical manufacturing.
    - A 10-week or more of full-time internship/co-op is equivalent to 4 credit hours.
    - Summer Undergraduate Research Fellowship or similar full-time undergraduate research internship is considered equivalent to 2 credit hours.
    - Relevant Study Abroad courses.

Technical Areas (9 credits)

At least 9 credit hours of courses in at least two out of four technical areas below (with at least 6 credit hours should be at 400-level or above.

Pharmaceutical Product Development and Regulatory Affairs

- ABE 51100 - Drug Development **Credits:** 3.00
- ABE 51200 - Good Regulatory Practices **Credits:** 3.00
- ABE 51300 - Quality Management, Audits, Inspections **Credits:** 3.00
- BIOL 39500 - Special Assignments **Credits:** 0.00 to 18.00
- BIOL 41500 - Introduction To Molecular Biology **Credits:** 3.00
- BIOL 41600 - Viruses And Viral Disease **Credits:** 3.00
- BIOL 51600 - Molecular Biology Of Cancer **Credits:** 3.00
- BIOL 53601 - Biological And Structural Aspects Of Drug Design And Action **Credits:** 3.00
- BIOL 53700 - Immunobiology **Credits:** 3.00
- BIOL 59500 - Special Assignments **Credits:** 0.00 to 18.00
  -Immunology, Cancer and Infectious Disease
  -Neural Mechanisms Health Disease
  -Pathways in Human Health and Disease
- BME 55600 - Introduction To Clinical Medicine For Engineering Solutions **Credits:** 3.00
- BME 56100 - Preclinical And Clinical Study Design **Credits:** 3.00
- BME 56200 - Regulatory Issues Surrounding Approval Of Biomedical Devices **Credits:** 3.00
- BME 56300 - Quality Systems For Regulatory Compliance **Credits:** 3.00
- BME 56400 - Ethical Engineering Of Medical Technologies **Credits:** 3.00
- CHE 59700 - Special Topics In Chemical Engineering **Credits:** 0.00 to 18.00
- HSOP 50100 - Food And Drug Law I **Credits:** 3.00
- IE 53000 - Quality Control **Credits:** 3.00
- IE 55800 - Safety Engineering **Credits:** 3.00
- IE 59000 - Topics In Industrial Engineering **Credits:** 1.00 to 6.00
- MCMP 54400 - Drug Classes And Mechanisms **Credits:** 3.00
- PHRM 46000 - Drug Discovery And Development I **Credits:** 3.00
- PHRM 46100 - Drug Discovery And Development II **Credits:** 3.00
- PHRM 82400 - Principles Of Pathophysiology And Drug Action **Credits:** 3.00
- PHRM 82800 - Dosage Forms I **Credits:** 3.00
- PHRM 82900 - Dosage Forms II **Credits:** 2.00
  Additional Approved Non-PWL Courses:
- BIOT 102 Survey of Good Manufacturing Practices (Ivy Tech)
- BIOT 103 Safety and Regulatory Compliance for Biotechnology (Ivy Tech)
- BIOT 104 Quality Practices (Ivy Tech)
- BIOT 105 Survey of Regulatory Affairs (Ivy Tech)
- BME 57100 Drug Delivery (IUPUI)

Pharmaceutical Manufacturing Science and Technology (Materials, Measurement and Manufacturing)

- ABE 30300 - Physical Chemistry In Biological Engineering **Credits:** 3.00
- ABE 30400 - Biological Engineering Laboratory **Credits:** 3.00
- ABE 30700 - Momentum Transfer In Biological Engineering **Credits:** 3.00
- ABE 30800 - Heat And Mass Transfer In Biological Engineering **Credits:** 3.00
- ABE 37000 - Reaction Kinetics In Biological Engineering **Credits:** 3.00
- ABE 45700 - Unit Operations In Biological Engineering **Credits:** 3.00
- ABE 46000 - Sensors And Process Control **Credits:** 3.00
- ABE 50501 - Particle, Powder, and Compact Characterization **Credits:** 2.00
- ABE 50502 - Particles, Powders, And Compact Characterization Laboratory **Credits:** 1.00

- ABE 55700 - Biological Engineering Design I **Credits:** 3.00
- ABE 55800 - Biological Engineering Design II **Credits:** 3.00
- BIOL 59500 - Special Assignments **Credits:** 0.00 to 18.00 - Methods and Measurements in Physical Biochem
- BME 47000 - Biomolecular Engineering **Credits:** 3.00
- CHE 53600 - Particulate Systems **Credits:** 3.00
- CHE 55100 - Principles Of Pharmaceutical Engineering **Credits:** 3.00
- CHE 55300 - Pharmaceutical Process, Development And Design **Credits:** 3.00
- CHE 55400 - Smart Manufacturing In Process Industries **Credits:** 3.00
- CHE 55500 - Computer Integrated Process Operations **Credits:** 3.00
- CHE 59700 - Special Topics In Chemical Engineering **Credits:** 0.00 to 18.00
  -Industrial Chemical Technology
  -Process Safety
- CHM 32100 - Analytical Chemistry I **Credits:** 4.00
- CHM 33900 - Biochemistry: A Molecular Approach **Credits:** 3.00
- CHM 42400 - Instrumental Analysis **Credits:** 4.00
- CHM 43300 - Biochemistry **Credits:** 3.00
- CHM 43800 - Introduction To Molecular Biotechnology **Credits:** 3.00
- IE 37000 - Manufacturing Processes I **Credits:** 3.00
- IE 57400 - Industrial Robotics And Flexible Assembly **Credits:** 3.00
- IE 59000 - Topics In Industrial Engineering **Credits:** 1.00 to 6.00
- ME 53101 - Particle, Powder, And Compact Characterization **Credits:** 2.00
- ME 53102 - Particle, Powder, And Compact Characterization Laboratory **Credits:** 1.00
- ME 59500 - Special-Topic Minicourses **Credits:** 1.00 - Powder Storage and Flow
- MGMT 45200 - Manufacturing Strategy And Process Innovation **Credits:** 3.00
- MSE 51200 - Powder Processing **Credits:** 3.00
- MSE 59700 - Selected Topics In Materials Engineering **Credits:** 0.00 to 18.00 - Lean Manufacturing
- PHRM 83600 - Biochemistry For Pharmaceutical Sciences II **Credits:** 2.00
  Additional Approved non-PWL Courses:
- BIOT 110 Pharmaceutical Product Manufacturing (Ivy Tech)
- BME 38100 Implantable Materials And Biological Response (IUPUI)
- BME 38800 Applied Biomaterials (IUPUI)
- BME 46100 Transport Processes In Biomedical Engineering (IUPUI)
- BME 58200 Advanced Biomedical Polymers (IUPUI)

Data Analytics and Computing

- ABE 30100 - Modeling And Computational Tools In Biological Engineering **Credits:** 3.00
- BME 40100 - Mathematical & Computational Analysis Of Complex System Dynamics In Biology, Medicine, & Healthcare **Credits:** 3.00
- BME 50100 - Multivariate Analyses In Biostatistics **Credits:** 3.00
- CHE 32000 - Statistical Modeling And Quality Enhancement **Credits:** 3.00
- CNIT 48800 - Data Warehousing **Credits:** 3.00
- CNIT 57000 - IT Data Analytics **Credits:** 3.00
- CS 24200 - Introduction To Data Science **Credits:** 3.00
- ECE 20875 - Python For Data Science **Credits:** 3.00
- ECE 47300 - Introduction To Artificial Intelligence **Credits:** 3.00
- IE 33200 - Computing In Industrial Engineering **Credits:** 3.00
- IE 33500 - Operations Research - Optimization **Credits:** 3.00

- IE 33600 - Operations Research - Stochastic Models **Credits:** 3.00
- IE 48100 - Introduction To System Simulation **Credits:** 3.00
- IE 49000 - Special Topics In Industrial Engineering **Credits:** 1.00 to 6.00 - Machine Learning and Its Appliactions
- IE 53300 - Industrial Applications Of Statistics **Credits:** 3.00
- IE 53500 - Linear Programming **Credits:** 3.00
- IE 53600 - Stochastic Models In Operations Research I **Credits:** 3.00
- IE 58000 - Systems Simulation **Credits:** 3.00
- IE 59000 - Topics In Industrial Engineering **Credits:** 1.00 to 6.00
- 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
- MGMT 47500 - Machine Learning For Business **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 54400 - Database Management Systems **Credits:** 3.00
- PHIL 20800 - Ethics Of Data Science **Credits:** 3.00
- POL 22800 - Data Science And Public Policy **Credits:** 3.00
- STAT 35500 - Statistics For Data Science **Credits:** 3.00

Supply Chain and Business Operations

- IE 49000 - Special Topics In Industrial Engineering **Credits:** 1.00 to 6.00 - Supply Chain Engineering
- IE 56600 - Production Management Control **Credits:** 3.00
- IE 57900 - Design And Control Of Production And Manufacturing Systems **Credits:** 3.00
- IE 58200 - Advanced Facilities Design **Credits:** 3.00
- MGMT 26100 - Introduction To Supply Chain Management **Credits:** 3.00
- MGMT 40500 - Six Sigma And Quality Analytics **Credits:** 3.00
- MGMT 46200 - Advanced Manufacturing Planning And Control Systems **Credits:** 3.00
- MGMT 46300 - Supply Chain Analytics **Credits:** 3.00
- MGMT 46400 - Logistics: Concepts And Models **Credits:** 3.00
- MGMT 46501 - Strategic Sourcing And Procurement **Credits:** 3.00
- MGMT 46600 - Project Management **Credits:** 3.00

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.

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The Data Mine

The Data Mine is a living, learning and research-based community created to introduce students to data science concepts and equip them to create solutions to real-world problems. Members of The Data Mine will be part of a team, living, studying and ultimately, performing data-driven research together. The Data Mine is part of Purdue University's Integrative Data Science Initiative, which is designed to train students across all majors with the data literacy needed to succeed in a data-driven world.

Our Mission: *Data Science for ALL*

The Data Mine is open to students from any major of study. Students will learn some of the skills most sought after by companies and graduate programs. No computational background is required. The key trait for joining The Data Mine is the desire to learn data science in a rigorous, but welcoming environment.

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