College of Engineering

College of Engineering

Overview

Highly Ranked

U.S. News and World Report ranked both our graduate and undergraduate programs in the Top 10 nationwide. Purdue's College of Engineering is among the largest in the United States and includes 13 academic programs all with high rankings. And we're accelerating the speed at which we progress. Together, we're bringing our college from excellence to preeminence.

Aggressive Growth

Purdue's College of Engineering is embarking on a period of remarkable growth. With the support of the Provost and Board of Trustees, we expect to increase the size of the CoE faculty by as much as 30% and the CoE staff by 28% over the next five years. Growth on this scale is an opportunity for Transformational change. More information can be found on our Strategic Growth Initiative page.

Interdisciplinary, Global, and Diverse

Our growth, fueled by our alumni and friends, is giving us the tools and room to develop more revolutionary technologies that are already changing the world around us. We are **cutting across the established boundaries of Purdue's engineering and related disciplines.** In doing so, we're incorporating all perspectives. We're taking advantage of our own diverse makeup, and we're approaching issues from a world point of view. We're **equipping our students** with the capacity **to perform in a fast-changing and increasingly global economy.**

To find out more about Purdue Engineering, check out the rest of this Web site. You can also contact us, or please come for a visit to see what Purdue and you can do together.

Engineering Degrees

First Year Engineering	Electrical & Computer Engineering
Aeronautical & Astronautical Engineering	Environmental & Ecological Engineering
Agricultural Engineering	Industrial Engineering
Biological Engineering	Interdisciplinary Engineering
Biomedical Engineering	Materials Engineering

Civil Engineering	Mechanical Engineering
Chemical Engineering	Multidisciplinary Engineering
Construction Engineering Management	Nuclear Engineering

Admissions

http://www.admissions.purdue.edu/majors/colleges.php?ClgCd=ENGR

First-Year Engineering at Purdue

The First-Year Engineering (FYE) Program of the School of Engineering Education is the entry point for all beginning engineering students. In the FYE program, students complete foundational coursework in math, science, engineering, and communications (oral and written). After this common first year, students choose their discipline of engineering and start to follow the plan of study of a particular degree program. The mission of this student-oriented program is to advise, prepare, and retain outstanding students for degree programs in Purdue's College of Engineering.

See First Year Engineering for more information.

Advising Information

Talk to an FYE Advisor

- make an appointment to meet with your FYE advisor
- learn about the walk-in schedule for FYE advisors or for Student Representatives of Professional Engineering Schools
- other common advisor questions

Contact Information

Office of the Dean of Engineering

Purdue University
Neil Armstrong Hall of Engineering, Suite 3000
701 West Stadium Ave.
West Lafayette, IN 47907-2045
E-mail: dean.of.engineering@purdue.edu
Phone: +1 (765) 494-5345
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For additional faculty and staff contact information, consult our directory.

First Year Engineering

Pre-Program

First Year Engineering

About the Program

The First-Year Engineering (FYE) Program of the School of Engineering Education is the entry point for all beginning engineering students. In the FYE program, students complete foundational coursework in math, science, engineering, and communications (oral and written). After this common first year, students choose their discipline of engineering and start to follow the plan of study of a particular degree program. The mission of this student-oriented program is to advise, prepare, and retain outstanding students for degree programs in Purdue's College of Engineering.

Talk to an FYE Advisor

- make an appointment to meet with your FYE advisor
- learn about the walk-in schedule for FYE advisors or for Student Representatives of Professional Engineering Schools
- other common advisor questions

30+ Credits Required

C- or better for any course used

Grade Average

To complete FYE, the student's cumulative GPA must be of 2.00 or greater, and an Engineering Admissions Index (EAI) must be 2.00 or greater. Calculation of the EAI is equivalent to the calculation of GPA for courses used to meet all FYE requirements above. If a student meets a requirement in more than one way, only one will be used to calculate the EAI. The FYE Curriculum Committee will be responsible for keeping an updated, clear, and universal set of rules for determining which course is used in EAI for these situations. These rules are available to students in the FYE Advising office.

Typical plan of study

The requirements of the FYE program are designed to be completed in two semesters (typically fall and spring) of full-time on-campus study. Individual plans of study may vary depending on student interest and ability, and on previously earned credit (through AP, dual-credit high school courses, etc.). A standard plan of study is listed below. Other options, such as Honors foundational engineering courses, also exist (full details are available on the FYE website). All courses in the standard plan of study are offered in all terms (fall, spring, and summer).

Semester 1

- ENGR 13100 - Transforming Ideas To Innovation I (meets Information Literacy Foundational Outcome)
- CHM 11500 - General Chemistry (meets Science Foundational Outcome)

- MA 16100 - Plane Analytic Geometry And Calculus I
  or
- MA 16500 - Analytic Geometry And Calculus I (meets Quantitative Reasoning Foundational Outcome)

- ENGL 10600 - First-Year Composition
  or
- COM 11400 - Fundamentals Of Speech Communication (meets Written or Oral Communication Foundational Outcome)

Semester 2

- ENGR 13200 - Transforming Ideas To Innovation II
- PHYS 17200 - Modern Mechanics (meets Science Foundational Outcome)

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

- ENGL 10600 - First-Year Composition
  or
- COM 11400 - Fundamentals Of Speech Communication (meets Written or Oral Communication Foundational Outcome)

Science Selective chosen from:

- CHM 11600 - General Chemistry
  or
- CS 15900 - Programming Applications For Engineers
  or
- BIOL 11000 - Fundamentals Of Biology I
  or
- BIOL 11100 - Fundamentals Of Biology II
  or
- BIOL 13100 - Biology II: Development, Structure, And Function Of Organisms
  or
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
  and
- BIOL 13500 - First year Biology Laboratory

Transitioning to a degree program

After completion of the FYE program, students may transition to one of fifteen degree programs in engineering (i.e., Mechanical, Electrical, Chemical, Civil, etc.); this happens through the "Transition to Major" (or T2M) process. As a student nears completion of FYE, he or she will inform FYE of their preferred choices of degree program (major). If the degree program is not at capacity, all students completing FYE requirements and requesting that degree program will be admitted. If the program is at capacity, admission will be based on academic record, including GPA, EAI, and grades in specific courses.

Disclaimer

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

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

School of Aeronautics and Astronautics

Aeronautical and Astronautical Engineering

The Aeronautics and Astronautics curriculum emphasizes the disciplines of aerodynamics, aerospace systems, astrodynamics and space applications, propulsion, structures and materials, dynamics and control, and further provides courses that integrate these disciplines into the design of flight vehicles to perform the required mission.

The field of aeronautical and astronautical engineering addresses the challenging problems encountered in the design and operation of many types of aircraft, missiles, and space vehicles and places a constant demand on research and development groups for an even greater understanding of basic physical phenomena.

Employers from around the world contact the School of Aeronautics and Astronautics with information regarding positions available within their organizations.

Mission Statement

To serve the State of Indiana and our Nation by providing degree granting programs - recognized as innovative learning experiences - that prepare students to be exceptional, recognized contributors to aeronautical and astronautical engineering in industry, government laboratories and universities.

To develop and maintain quality graduate research programs in technical areas relevant to Aeronautics and Astronautics and to foster a collegial and challenging intellectual environment necessary to conduct enabling and breakthrough research for aerospace systems.

Faculty

https://engineering.purdue.edu/AAE/People/Faculty

Contact Information

Reception

Armstrong Hall of Engineering
Room 3300
(765) 494-5117 *Phone*
(765) 494-0307 *FAX*

Undergraduate Student Services

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(765)494-4086

Lisa Crain
Undergraduate Program Coordinator
ARMS 3314
lcrain@purdue.edu
(765) 494-5157

Graduate Information

For Graduate Information please see Aeronautics and Astronautics Graduate Program Information.

Baccalaureate

Aeronautics and Astronautics Engineering, BSAAE

About the Program

The field of aeronautical and astronautical engineering includes the challenging problems encountered in the design and operation of many types of aircraft, missiles, and space vehicles and puts a constant demand on research and development groups for an even better understanding of basic physical phenomena.

Aeronautical education has existed on at least a small scale at Purdue University since about 1920. Aeronautical Engineering degrees were first offered at Purdue by the School of Mechanical & Aeronautical Engineering during WWII, and the first B.S. Degrees were awarded in 1943. The School of Aeronautics was established as a separate entity on July 1, 1945. (For a complete history visit the School's history page.)

During the first sixty years of its existence, the School of Aeronautics and Astronautics has awarded 5,824 BS degrees, 1,439 MS degrees and 474 PhD degrees. These graduates have made significant contributions to the aerospace field, and have held

positions of high responsibility in government and private industry. Twenty-three graduates of Purdue have become astronauts, and of these, fourteen have been graduates of the School of Aeronautics and Astronautics.

The Aeronautical and Astronautical Engineering curriculum concentrates on the fundamental subject areas necessary to the research, development, design, and operation of the aerospace industry. The curriculum is designed to emphasize the disciplines of aerodynamics, propulsion, structures, dynamics, and control, and further provides design courses to integrate these disciplines into the design of flight vehicles that will perform the required mission. A strong background in mathematics and physics is required to pursue these disciplines, and extensive use of computers and programming skills is a necessity.

The future holds many interesting challenges. The record shows that our graduates have demonstrated their ability to provide technical leadership in a variety of successfully completed projects. A degree from Purdue University in the School of Aeronautics and Astronautics promises to prepare our future graduates for the 21st century in the aerospace field.

Degree Requirements

130 Credits Required

AAE Engineering Major Courses (41 credits)

- AAE 20000 - Undergraduate Sophomore Seminar
- AAE 20300 - Aeromechanics I
- AAE 25100 - Introduction To Aerospace Design
- AAE 20400 - Aeromechanics II
- AAE 20401 - Aeromechanics II Laboratory
- AAE 30000 - Undergraduate Junior Seminar
- AAE 30100 - Signal Analysis For Aerospace Engineering
- AAE 33300 - Fluid Mechanics
- AAE 33301 - Fluid Mechanics Laboratory
- AAE 33400 - Aerodynamics

- AAE 33401 - Aerodynamics Laboratory
  or
- AAE 35201 - Structural Analysis I Laboratory

- AAE 33800 - Thermal Sciences
  or
- AAE 33900 - Aerospace Propulsion

- AAE 34000 - Dynamics And Vibrations
- AAE 35200 - Structural Analysis I
- AAE 36400 - Control System Analysis
- AAE 36401 - Control Systems Laboratory
- AAE 40000 - Undergraduate Senior Seminar

- AAE 42100 - Flight Dynamics And Control
  or
- AAE 44000 - Spacecraft Attitude Dynamics

- AAE 45000 - Spacecraft Design
  or
- AAE 45100 - Aircraft Design

AAE Technical Electives (6 credits)

See technical electives.

AAE Specialization (9 credits)

See AAE specialization.

AAE Selectives (6 credits)

See AAE selectives.

Other Departmental /Program Course Requirements (50 credits)

- CGT 16300 - Graphical Communication And Spatial Analysis
- CHM 11500 - General Chemistry (Satisfies FYE requirement)
- COM 11400 - Fundamentals Of Speech Communication (strongly recommended)
- CS 15900 - Programming Applications For Engineers (Satisfies FYE requirement)
- ENGR 13100 - Transforming Ideas To Innovation I (Satisfies FYE requirement)
- ENGR 13200 - Transforming Ideas To Innovation II (Satisfies FYE requirement)

- ENGL 10600 - First-Year Composition (Satisfies FYE requirement)
  or
- ENGL 10800 - Accelerated First-Year Composition (Satisfies FYE requirement)

- MA 16500 - Analytic Geometry And Calculus I (Satisfies FYE requirement)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (Satisfies FYE requirement)

- MA 16600 - Analytic Geometry And Calculus II (Satisfies FYE requirement)
  or
- MA 16200 - Plane Analytic Geometry And Calculus II (Satisfies FYE requirement)

- MA 26100 - Multivariate Calculus (satisfies Math and Physics requirement)
- MA 26500 - Linear Algebra (satisfies Math and Physics requirement)
- MA 26600 - Ordinary Differential Equations (satisfies Math and Physics requirement)
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences
- ME 20000 - Thermodynamics I
- PHYS 17200 - Modern Mechanics (Satisfies FYE requirement)

- PHYS 24100 - Electricity And Optics (satisfies Math and Physics requirement)
  or
- PHYS 27200 - Electric And Magnetic Interactions (satisfies Math and Physics requirement)

Note

COM 11400 is a highly recommended general elective and is counted separately from the 18 credits of Gen Ed requirement. Therefore the Gen Ed requirement is 18 + 3 credits = 21 when including COM 11400. AAE also requires students to complete a business elective and a communications/writing elective at the 300-level or higher.

General Electives (18 credits)

- G.E.-I - Credit Hours: 3.00
- G.E.-II - Credit Hours: 3.00
- G.E.-III - Credit Hours: 3.00
- G.E.-IV - Credit Hours: 3.00
- G.E.-V - Credit Hours: 3.00
- G.E.-VI - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry (satisfies Science Selective for core)

- ENGL 10600 - First-Year Composition (satisfies Written Communication for core)
  or
- ENGL 10800 - Accelerated First-Year Composition (satisfies Written Communication for core)

- ENGR 13100 - Transforming Ideas To Innovation I (satisfies Information Literacy for core)

- CGT 16300 - Graphical Communication And Spatial Analysis **

15 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II

- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)
  or
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II

- CS 15900 - Programming Applications For Engineers **
- ENGR 13200 - Transforming Ideas To Innovation II *
- COM 11400 - Fundamentals Of Speech Communication (satisfies oral communication for core)

16 Credits

Fall 2nd Year

- AAE 20300 - Aeromechanics I ++
- AAE 25100 - Introduction To Aerospace Design
- MA 26100 - Multivariate Calculus
- Gen Elective I - Credit Hours: 3.00 - See attached list
- MA 26500 - Linear Algebra (satisfies Quantitative Reasoning for core)
- AAE 20000 - Undergraduate Sophomore Seminar

16 Credits

Spring 2nd Year

- AAE 20400 - Aeromechanics II ++
- AAE 20401 - Aeromechanics II Laboratory
- PHYS 24100 - Electricity And Optics **
- MA 26600 - Ordinary Differential Equations
- ME 20000 - Thermodynamics I **
- Gen Elective II - Credit Hours: 3.00 - See attached list

16 Credits

Fall 3rd Year

- AAE 33300 - Fluid Mechanics
- AAE 33301 - Fluid Mechanics Laboratory
- AAE 35200 - Structural Analysis I
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences
- AAE 30100 - Signal Analysis For Aerospace Engineering
- AAE 30000 - Undergraduate Junior Seminar
- Gen Elective III - Credit Hours: 3.00 - See attached list

16 Credits

Spring 3rd Year

- AAE 33400 - Aerodynamics
- AAE 33401 - Aerodynamics Laboratory
  or
- AAE 35201 - Structural Analysis I Laboratory
- AAE 33800 - Thermal Sciences
  or
- AAE 33900 - Aerospace Propulsion
- AAE 34000 - Dynamics And Vibrations
- AAE 36400 - Control System Analysis
- Gen Elective IV - Credit Hours: 3.00 - See attached list

16 Credits

Fall 4th Year

- AAE 36401 - Control Systems Laboratory
- Specialization/Selectives - Credit Hours: 6.00 - See attached list
- Gen Elective V - Credit Hours: 3.00 - see attached list
- Tech Elective - Credit Hours: 3.00 - See attached list
- AAE 40000 - Undergraduate Senior Seminar
- AAE 42100 - Flight Dynamics And Control or Tech Elective - See attached list

17 Credits

Spring 4th Year

- AAE 44000 - Spacecraft Attitude Dynamics
  or
- Tech Elective - see attached list - Credit Hours: 3.00

- Specialization/Selectives - Credit Hours: 9.00 - See attached list
- Gen Elective VI - Credit Hours: 3.00 - See attached list

- AAE 45000 - Spacecraft Design
  or
- AAE 45100 - Aircraft Design

18 Credits

Notes

*Satisfies a University Core Requirement

**Satisfies a Non-departmental Major Course Requirement

++Students must earn a "C-" or better

2.0 Graduation GPA required for Bachelor of Science degree.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

Department of Agricultural and Biological Engineering

Overview

Welcome to the Department of Agricultural & Biological Engineering at Purdue University. Our mission is to prepare students, citizens, and industry for the future through innovative education and extension/outreach programs and the discovery of knowledge.

Our cross-disciplinary strengths include academic and research programs in agriculture, biology, and engineering, as well as dual degree programs. Our engineering degrees are granted by the College of Engineering and our agricultural systems management degree is granted by the College of Agriculture. The job market remains strong for our graduates who have excellent career opportunities, and demand for our graduates is very high.

Our faculty, students and staff are pursuing cutting-edge research that improves quality of life as well as advances scientific and engineering frontiers. Our extension programs are helping citizens of Indiana and beyond improve their lives.

Overview of Agricultural & Biological Engineering

Agricultural Systems Management

The Agricultural Systems Management program prepares graduates to develop and manage technology-intensive agricultural production and processing systems. ASM graduates are problem solvers. They benefit from a diverse applied agricultural curriculum that includes opportunities for extensive career-related experience at home and abroad.

Biological Engineering

This program deals with the applications of basic scientific and engineering principles to the design, development and operation of large scale manufacture of food and biologically-based products. Such products are environmentally friendly, renewable and represent a future wave of consumer demand for better health and environment. In addition to learning the engineering aspects of food and biological processing, you will also learn the basic principles in biochemistry and food sciences.

Dual Degree programs with Biological Engineering and Biochemistry or Pharmaceutical Sciences are also offered - these programs require an additional year of courses leading to two degrees.

Agricultural Engineering - emphasis in Environmental & Natural Resources Engineering

This emphasis area prepares engineers with specialized expertise to design and analyze new and environmentally sound ways to produce food and fiber while conserving our natural resources. Students gain expertise in areas such as watershed management, geographic information systems, computer-based watershed modeling, and contaminant transport models, and soil and water conservation engineering practices.

Agricultural Engineering - emphasis in Machine Systems Engineering

This emphasis area prepares students with a background in mechanical design, hydraulics, instrumentation and control, finite element analysis, electronics and sensors to design, develop, analyze and operate machines and systems for agricultural and biological products and processes, materials handling, construction and mining, forestry, lawn- and ground-care, and food and fiber production and processing.

Faculty

https://engineering.purdue.edu/ABE/People/ptFaculty

Contact Information

Purdue University
Agricultural & Biological Engineering
225 South University Street
West Lafayette, IN 47907-2093
Phone: (765) 494-1162

Fax: (765) 496-1115
www.purdue.edu/abe

Graduate Information

For Graduate Information please see Agricultural and Biological Engineering Graduate Program Information.

Undergraduate Information

For undergraduate programs and information, please see the College of Agriculture, or the Department of Agricultural and Biological Engineering page.

Weldon School of Biomedical Engineering

Biomedical Engineering

Students in Biomedical Engineering learn to apply tools from engineering and life sciences to design solutions for challenges in human biology, medicine, and healthcare delivery.

Biomedical Engineering students complete coursework in math, physics, chemistry and the life science in combination with engineering principles and design courses to understand the physical and chemical properties of human tissues, computational modeling and analyses, molecular transport, biomechanics, human physiology, and biomedical systems and instrumentation. Essential experiential and practical training includes small group problem-based learning, study abroad programs, internships with a broad range of medically related companies, research in faculty labs, and engineering design projects to solve real medical needs.

The home for the **Weldon School of Biomedical Engineerin**g is a state-of-the-art building specifically designed to enhance both teaching and research. The $25-million, 91,000-square-foot facility accommodates the continued growth of biomedical engineering in the 21st century.

Programs of focus and faculty expertise include imaging, instrumentation, engineered biomaterials and biomechanics, and quantitative cellular and systems engineering.

Faculty

https://engineering.purdue.edu/BME/People

Contact Information

Weldon School of Biomedical Engineering
Purdue University
206 S. Martin Jischke Drive
West Lafayette, IN 47907-2032
Phone: (765) 494-2995
Email: WeldonBME@purdue.edu

Weldon BME Undergraduate Program
BME Undergraduate Webpage

WeldonBMEUndergrad@purdue.edu

Graduate Information

For Graduate Information please see Biomedical Engineering Graduate Program Information.

Baccalaureate

Biomedical Engineering, BSBME

About the Program

Students in Biomedical Engineering learn to apply tools from engineering and life sciences to design solutions for challenges in human biology, medicine, and healthcare delivery.

Biomedical Engineering students complete coursework in math, physics, chemistry and the life science in combination with engineering principles and design courses to understand the physical and chemical properties of human tissues, computational modeling and analyses, molecular transport, biomechanics, human physiology, and biomedical systems and instrumentation. Essential experiential and practical training includes small group problem-based learning, study abroad programs, internships with a broad range of medically related companies, research in faculty labs, and engineering design projects to solve real medical needs.

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Programs of focus and faculty expertise include imaging, instrumentation, engineered biomaterials and biomechanics, and quantitative cellular and systems engineering.

Degree Requirements

130 Credits Required

Required Biomedical Engineering Courses (38 credits)

https://engineering.purdue.edu/BME/Academics/Undergraduate

For First Year Engineeering students, please review the information on this page: engineering.purdue.edu/BME/Academics/Undergraduate/FYE

BME Courses (29 credits) *

- BME 20100 - Biomolecules: Structure, Function, And Engineering Applications
- BME 20500 - Biomolecular And Cellular Systems Laboratory
- BME 29000 - Frontiers In Biomedical Engineering
- BME 20400 - Biomechanics Of Hard And Soft Tissues
- BME 20600 - Biomechanics And Biomaterials Laboratory
- BME 25600 - Physiological Modeling In Human Health
- BME 30100 - Bioelectricity
- BME 30400 - Biomedical Transport Fundamentals
- BME 30500 - Bioinstrumentation Circuit And Measurement Principles
- BME 30600 - Biotransport Laboratory
- BME 39000 - Professional Development And Design In Biomedical Engineering
- BME 48901 - Senior Design Project
- BME 49000 - Professional Elements Of Design

Core Engineering Courses (9 credits) *

- ME 27000 - Basic Mechanics I
- ABE 20200 - Thermodynamics In Biological Systems II
- ECE 30100 - Signals And Systems

Selectives (21 credits)

- Engineering Selectives (Including Quantitative Breadth requirement) - Credit Hours: 15.00
- Life Science Selectives - Credit Hours: 6.00

Other Program Course Requirements (68 credits)

- MA 16500 - Analytic Geometry And Calculus I (Satisfies FYE requirement)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I

- MA 16600 - Analytic Geometry And Calculus II (Satisfies FYE requirement)
  or
- MA 16200 - Plane Analytic Geometry And Calculus II
  or
- MA 17300 - Calculus And Analytic Geometry II

- MA 26100 - Multivariate Calculus (Satisfies Math and Physics requirement)
- MA 26200 - Linear Algebra And Differential Equations (Satisfies Math and Physics requirement)

- STAT 35000 - Introduction To Statistics (Satisfies Biomedical Engineering Required Course requirement)*
  or
- STAT 51100 - Statistical Methods

or

- CHE 32000 - Statistical Modeling And Quality Enhancement
  or
- IE 33000 - Probability And Statistics In Engineering II
  or
- STAT 41600 - Probability
  and
- STAT 41700 - Statistical Theory

- CHM 11500 - General Chemistry (Satisfies FYE requirement; Science Selective for core)

- CHM 11600 - General Chemistry (Satisfies FYE requirement; Science Selective for core)
  or
- CHM 13600 - General Chemistry Honors

- PHYS 17200 - Modern Mechanics (Satisfies FYE requirement; Science Selective for core)
- PHYS 24100 - Electricity And Optics (Satisfies Math and Physics requirement)
- BIOL 23000 - Biology Of The Living Cell (Satisfies Life Science Core requirement)

- ENGR 13100 - Transforming Ideas To Innovation I (Satisfies FYE requirement)
  or
- ENGR 14100 - Honors Creativity And Innovation In Engineering Design I

- ENGR 13200 - Transforming Ideas To Innovation II (Satisfies FYE requirement)
  or
- ENGR 14200 - Honors Creativity And Innovation In Engineering Design II

- CS 15900 - Programming Applications For Engineers (Satisfies FYE Science Requirement)

- ENGL 10600 - First-Year Composition (Satisfies FYE requirement; Written Communication/ Informational Literacy for core)
  or
- ENGL 10800 - Accelerated First-Year Composition

- COM 11400 - Fundamentals Of Speech Communication (Satisfies FYE requirement; Oral Communication for core)
  or
- EDPS 31500 - Collaborative Leadership: Interpersonal Skills

- Ethics/Healthcare Policy Selective - Credit Hours: 3.00
- G.E.-II - Credit Hours: 3.00
- G.E.-III - Credit Hours: 3.00
- G.E.-IV - Credit Hours: 3.00
- G.E.-V - Credit Hours: 3.00
- G.E.-VI - Credit Hours: 3.00

Electives (3 credits)

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGR 13100 - Transforming Ideas To Innovation I

- ENGL 10600 - First-Year Composition
  or
- ENGL 10800 - Accelerated First-Year Composition

13-14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- CHM 11600 - General Chemistry
- PHYS 17200 - Modern Mechanics
- ENGR 13200 - Transforming Ideas To Innovation II

- COM 11400 - Fundamentals Of Speech Communication
  or
- EDPS 31500 - Collaborative Leadership: Interpersonal Skills

17 Credits

Fall 2nd Year

- BIOL 23000 - Biology Of The Living Cell
- BME 20100 - Biomolecules: Structure, Function, And Engineering Applications
- BME 20500 - Biomolecular And Cellular Systems Laboratory
- BME 29000 - Frontiers In Biomedical Engineering
- MA 26100 - Multivariate Calculus
- ME 27000 - Basic Mechanics I
- CS 15900 - Programming Applications For Engineers

18 Credits

Spring 2nd Year

- ABE 20200 - Thermodynamics In Biological Systems II
- BME 20400 - Biomechanics Of Hard And Soft Tissues
- BME 20600 - Biomechanics And Biomaterials Laboratory
- BME 25600 - Physiological Modeling In Human Health
- MA 26200 - Linear Algebra And Differential Equations
- PHYS 24100 - Electricity And Optics

17 Credits

Fall 3rd Year

- General Education or Ethics Selective - Credit Hours: 3.00
- BME 30100 - Bioelectricity
- BME 30500 - Bioinstrumentation Circuit And Measurement Principles
- BME 30400 - Biomedical Transport Fundamentals

- STAT 35000 - Introduction To Statistics
  or
- STAT 51100 - Statistical Methods (preferred for BME)

15 Credits

Spring 3rd Year

- BME 30600 - Biotransport Laboratory
- BME 39000 - Professional Development And Design In Biomedical Engineering
- ECE 30100 - Signals And Systems
- Engineering Selective - Credit Hours: 3.00
- Engineering Selective (Quantatative Breadth) - Credit Hours: 3.00
- General Elective or Ethics Selective - Credit Hours: 3.00

16 Credits

Fall 4th Year

- BME 48901 - Senior Design Project
- BME 49000 - Professional Elements Of Design
- Engineering Selective - Credit Hours: 3.00
- Life Science Selective - Credit Hours: 3.00
- General Elective - Credit Hours: 3.00
- General Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

- Engineering Selective - Credit Hours: 3.00
- Engineering Selective - Credit Hours: 3.00
- Life Science Selective - Credit Hours: 3.00
- General Elective - Credit Hours: 3.00
- General Elective - Credit Hours: 3.00
- Unrestricted Elective - Credit Hours: 3.00

18 Credits

Notes

* Courses used to calculate BME Major GPA

A minimum Graduation Index and BME Major GPA of at least 2.0 is required to qualify for graduation with a BSBME.

All required First Year Engineering (FYE) courses must be completed with a C- or above for entry into BME.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

School of Chemical Engineering

Chemical Engineering Overview

Chemical Engineering remains a premier source of well-educated, well-prepared chemical engineers, educating students using innovative technologies and fostering an environment that inspires leading-edge research.

Chemical engineers work in a wide range of industries with worldwide impact. Applications include energy; pharmaceuticals and biological materials; the nutritional value of food; environmental protection and restoration; materials for computing, sensing, and communications; personal care, home care, and home health products; and system and data management.

Chemical engineers rely on their knowledge of mathematics and science - particularly chemistry - to overcome technical problems in industry and society. While the chemist studies basic chemical reactions, the chemical engineer applies the results of chemical research and transforms laboratory processes into efficient, full-scale processes or facilities. With their strong problem-solving skills and fundamental background in mathematics, physics, chemistry and biology, chemical engineers can seize opportunities to translate industrial problems into competitive advantages. Currently, chemical engineers demand among the highest salaries for college graduates with a bachelor's degree.

Research here is currently being conducted with polymers and materials, nanoscale science and engineering, fluid mechanics, catalyst design and engineering, sensors, biotechnology, and many others.

Faculty

https://engineering.purdue.edu/ChE/People/ptFaculty

Contact Information

Chemical Engineering Undergraduate Office

Forney Hall of Chemical Engineering, Room G041
(765) 494-5650 Phone
(765) 494-0307 FAX

Dr. David Corti

Director of Undergraduate Studies, Professor of Chemical Engineering

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Undergraduate Office Secretary

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Graduate Information

For Graduate Information please see Chemical Engineering Graduate Program Information.

Baccalaureate

Chemical Engineering, BSCHE

About the Program

Chemical Engineering remains a premier source of well-educated, well-prepared chemical engineers, educating students using innovative technologies and fostering an environment that inspires leading-edge research.

Chemical engineers work in a wide range of industries with worldwide impact. Applications include energy; pharmaceuticals and biological materials; the nutritional value of food; environmental protection and restoration; materials for computing, sensing, and communications; personal care, home care, and home health products; and system and data management.

Chemical engineers rely on their knowledge of mathematics and science - particularly chemistry - to overcome technical problems in industry and society. While the chemist studies basic chemical reactions, the chemical engineer applies the results of chemical research and transforms laboratory processes into efficient, full-scale processes or facilities. With their strong problem-solving skills and fundamental background in mathematics, physics, chemistry and biology, chemical engineers can seize opportunities to translate industrial problems into competitive advantages. Currently, chemical engineers demand among the highest salaries for college graduates with a bachelor's degree.

Research here is currently being conducted with polymers and materials, nanoscale science and engineering, fluid mechanics, catalyst design and engineering, sensors, biotechnology, and many others.

Degree Requirements

130 Credits Required

Major Required Courses (41 credits)

- CHE 20000 - Chemical Engineering Seminar
- CHE 20500 - Chemical Engineering Calculations
- CHE 21100 - Introductory Chemical Engineering Thermodynamics
- CHE 30000 - Chemical Engineering Seminar
- CHE 30600 - Design Of Staged Separation Processes
- CHE 32000 - Statistical Modeling And Quality Enhancement
- CHE 34800 - Chemical Reaction Engineering
- CHE 37700 - Momentum Transfer
- CHE 37800 - Heat And Mass Transfer
- CHE 40000 - Chemical Engineering Seminar
- CHE 42000 - Process Safety Management And Analysis
- CHE 43500 - Chemical Engineering Laboratory
- CHE 45000 - Design And Analysis Of Processing Systems
- CHE 45600 - Process Dynamics And Control

Other Departmental Courses (89 credits)

- Biology Selective (Select from List) - Credit Hours: 3.00
- Chemical Engineering Selective (Select from List) - Credit Hours: 3.00
- CHM 11500 - General Chemistry (satisfies Science Selective for core)
- CHM 11600 - General Chemistry (satisfies FYE Science Selective)
- CHM 26100 - Organic Chemistry
- CHM 26300 - Organic Chemistry Laboratory
- CHM 26200 - Organic Chemistry
- CHM 26400 - Organic Chemistry Laboratory
- CHM 37000 - Topics In Physical Chemistry
- COM 11400 - Fundamentals Of Speech Communication (satisfies Oral Communication for core)
- ENGL 10600 - First-Year Composition (satisfies Written Communication for core)
- ENGR 13100 - Transforming Ideas To Innovation I (satisfies Information Literacy for core)
- ENGR 13200 - Transforming Ideas To Innovation II
- Engineering Selective (select from list) - Credit Hours: 3.00
- Engineering Selective (select from list) - Credit Hours: 3.00
- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning for core)
- MA 16600 - Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus

- Math Selective I (select from list) - Credit Hours: 4.00
- Math Selective II (select from list) - Credit Hours: 3.00

- PHYS 17200 - Modern Mechanics (satisfies FYE Science Selective)
  or
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II

- PHYS 24100 - Electricity And Optics
- Technical Selective - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective I (satisfies Human Cultures: Humanities for core) - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective II (satisfies Human Cultures: Behavioral Social Science for core) - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective III (satisifies Science, Technology, & Society for core) - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective IV - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective V - Upper Level - Select from Supplemental List - Credit Hours: 3.00
- General Education Elective VI - Upper Level - Select from Supplemental List - Credit Hours: 3.00

Free Electives (0 - 11 credits)

- Free Elective (for students who complete ENGL 10800) - Credit Hours: 1.00
- Free Elective (for students who complete MA 26500 for Math Selective I) - Credit Hours: 1.00
- Free Elective (for students who complete a course that fulfills both Science, Technology, & Society and Technical Elective) - Credit Hours: 3.00
- Free Elective (for students who complete a course that fulfills both Humanities/ Behavioral Social Science/ Science, Technology & Society, and General Education Elective V) - Credit Hours: 3.00
- Free Elective (for students who complete a course that fulfills both Humanities/ Behavioral Social Science/ Science, Technology & Society, and General Education Elective VI) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Degree Requirements

For Chemical Engineering selectives click here. For general education electives click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGL 10600 - First-Year Composition
- ENGR 13100 - Transforming Ideas To Innovation I

14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- CHM 11600 - General Chemistry
- COM 11400 - Fundamentals Of Speech Communication
- ENGR 13200 - Transforming Ideas To Innovation II

- PHYS 17200 - Modern Mechanics
  or
- ENGR 16200 - Honors Introduction To Innovation And The Physical Science Of Engineering Design II

17 Credits

Fall 2nd Year

- CHE 20000 - Chemical Engineering Seminar
- CHE 20500 - Chemical Engineering Calculations ♦
- CHM 26100 - Organic Chemistry
- CHM 26300 - Organic Chemistry Laboratory
- MA 26100 - Multivariate Calculus
- PHYS 24100 - Electricity And Optics
- General Education Elective I - Credit Hours: 3.00

18 Credits

Spring 2nd Year

- CHE 21100 - Introductory Chemical Engineering Thermodynamics ♦
- CHE 32000 - Statistical Modeling And Quality Enhancement ♦
- CHM 26200 - Organic Chemistry
- CHM 26400 - Organic Chemistry Laboratory
- Math Selective I - Credit Hours: 3.00 - 4.00
- General Education Elective II - Credit Hours: 3.00

18 Credits

Fall 3rd Year

- CHE 30600 - Design Of Staged Separation Processes ♦
- CHE 37700 - Momentum Transfer ♦
- CHM 37000 - Topics In Physical Chemistry
- Math Selective II - Credit Hours: 3.00
- Biology Selective - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- CHE 30000 - Chemical Engineering Seminar
- CHE 37800 - Heat And Mass Transfer ♦
- CHE 34800 - Chemical Reaction Engineering ♦
- Technical Elective - Credit Hours: 3.00
- Engineering Elective - Credit Hours: 3.00
- General Education Elective III - Credit Hours: 3.00

17 Credits

Fall 4th Year

- CHE 40000 - Chemical Engineering Seminar
- CHE 45600 - Process Dynamics And Control
- CHE 43500 - Chemical Engineering Laboratory
- CHE 42000 - Process Safety Management And Analysis
- General Education Elective IV - Credit Hours: 3.00

14 Credits

Spring 4th Year

- CHE 45000 - Design And Analysis Of Processing Systems
- CHE Elective - Credit Hours: 3.00
- ENGR Elective - Credit Hours: 3.00
- General Education Elective V - Upper Level - Credit Hours: 3.00
- General Education Elective VI - Upper Level - Credit Hours: 3.00

16 Credits

Notes

Students must earn a "C" or better in CHE 20500 to enroll in any other CHE course.

Students must earn a "C-" or better in CHE 21100, CHE 30600, CHE 32000, CHE 37700, CHE 37800 to enroll in upper level CHE courses.

2.0 Graduation GPA required for Bachelor of Science degree.

Students may take General Education Elective IV, V, and VI for a letter grade or pass/ no pass option.

3 credits of CHE 41100, CHE 41200, CHE 49800, or CHE 49900 may be used to complete the Chemical Engineering Selective.

3 credits of CHE 41100, 41200, 49800, or 49800 may be used to complete the Engineering or Technical Selective.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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Lyles School of Civil Engineering

About Civil Engineering

Civil engineers design and construct the world's infrastructure: buildings and bridges; tunnels, dams, and levees; harbors and canals; water-supply and waste-disposal systems; airports, highways, and railroads; pipelines and power lines.

As a Civil Engineering undergraduate student you have many opportunities to plan your curriculum and even more opportunities to build your future in civil engineering!

You can explore the nine areas of study within civil engineering along with selecting the courses to design your own plan of study. You and your advisor can discuss your career goals to tailor a program to meet your goals.

Instructional laboratories in structural behavior, hydraulics, surveying, and civil engineering materials are offered in the sophomore and junior years. Further study includes 30 credits of technical electives allowing students to tailor their studies to their specialty area of choice. Speciality areas include architectural, construction, environmental, geomatics, geotechnical, hydraulics, materials, structures, transportation, and infrastructure system engineering.

Senior design projects consist of real-world applications in theoretical role play. Recent projects have included designing possible layouts for the US-231 bypass that runs around the perimeter of campus to connect its north and south ends. Another project explored adding box seats to our basketball arena by raising the roof to make room. Another project explored a reuse design for the Tippecanoe County Superfund Site Sanitary Landfill. Students participate in these projects from site exploration, to budget management, to mock designs.

Faculty

https://engineering.purdue.edu/CE/People/Faculty

Contact Information

Lyles School of Civil Engineering
Delon and Elizabeth Hampton Hall of Civil Engineering
550 Stadium Mall Drive
West Lafayette, IN 47907-2051
CE Main Office: (765) 494-2166
CE Main Office Fax: (765) 494-0395

Graduate Information

For Graduate Information please see Civil Engineering Graduate Program Information.

Baccalaureate

Civil Engineering, BSCE

About the Program

Civil engineers design and construct the world's infrastructure: buildings and bridges; tunnels, dams, and levees; harbors and canals; water-supply and waste-disposal systems; airports, highways, and railroads; pipelines and power lines.

As a Civil Engineering undergraduate student you have many opportunities to plan your curriculum and even more opportunities to build your future in civil engineering!

You can explore the nine areas of study within civil engineering along with selecting the courses to design your own plan of study. You and your advisor can discuss your career goals to tailor a program to meet your goals.

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Senior design projects consist of real-world applications in theoretical role play. Recent projects have included designing possible layouts for the proposed US-231 bypass that will run around the perimeter of campus to connect its north and south ends. Another project explored adding box seats to our basketball arena by raising the roof to make room. Another project explored a reuse design for the Tippecanoe County Superfund Site Sanitary Landfill. Students participate in these projects from site exploration, to budget management, to mock designs.

Degree Requirements

132 Credits Required

Civil Engineering Major Courses

Required CE Courses (61 credits)

Grade of C- or better required

- COM 11400 - Fundamentals Of Speech Communication (Satisifes UCC: Oral Communication)
- CGT 16400 - Graphics For Civil Engineering And Construction
- MA 26100 - Multivariate Calculus
- CE 20300 - Principles And Practice Of Geomatics
- CE 29202 - Contemporary Issues In Civil Engineering
- PHYS 24100 - Electricity And Optics
- CE 29700 - Basic Mechanics I (Statics)
- MA 26500 - Linear Algebra
- CE 23100 - Engineering Materials I
- CE 27000 - Introductory Structural Mechanics
- CE 29800 - Basic Mechanics II Dynamics
- MA 26600 - Ordinary Differential Equations
- CE 33100 - Engineering Materials II
- CE 34000 - Hydraulics
- CE 34300 - Elementary Hydraulics Laboratory
- STAT 51100 - Statistical Methods
- CE 39201 - Technical Communication In Civil Engineering
- CE 39800 - Introduction To Civil Engineering Systems Design
- Basic Science Selective - Credit Hours: 3.00 (Satisifes UCC: Science, Tech & Society)

- ME 20000 - Thermodynamics I
- CE 49800 - Civil Engineering Design Project

CE Technical Electives (30 credits)

Elective course list

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- Technical Elective IV - Credit Hours: 3.00
- Technical Elective V - Credit Hours: 3.00
- Technical Elective VI - Credit Hours: 3.00
- Technical Elective VII - Credit Hours: 3.00
- Technical Elective VIII - Credit Hours: 3.00
- Technical Elective IX - Credit Hours: 3.00
- Technical Elective X - Credit Hours: 3.00

Other Departmental / Program Course Requirements (26-30 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement); (satisfies UCC: Quant Reasoning)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement)

- MA 16600 - Analytic Geometry And Calculus II (satisfies FYE requirement)
  or
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies FYE requirement)

- CHM 11500 - General Chemistry (satisfies FYE requirement); (satisfies UCC: Sciene)

- ENGL 10600 - First-Year Composition
  or
- ENGL 10800 - Accelerated First-Year Composition (satisfies FYE requirement); (satisifes UCC: Written Communication and UCC: Information Literacy)

- PHYS 17200 - Modern Mechanics (satisfies FYE requirement); (satisfies UCC: Science)
- ENGR 13100 - Transforming Ideas To Innovation I (satisfies FYE requirement)
- ENGR 13200 - Transforming Ideas To Innovation II (satisfies FYE requirement)

- CS 15900 - Programming Applications For Engineers (satisfies FYE Science Selective requirement)
  or
- CHM 11600 - General Chemistry (satisfies FYE Science Selective requirement)

General Education Electives (15 credits)

(plus 1 cr from CE 29202 and 2 cr CE 39201)

Elective course list

- General Education Elective I - Credit Hours: 3.00 (Satisfies UCC: Humanities)
- General Education Elective II - Credit Hours: 3.00 (Satisifes UCC: Behavior Social Science)
- General Education Elective III - Credit Hours: 3.00
- General Education Elective IV - Credit Hours: 3.00
- General Education Elective V - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGR 13100 - Transforming Ideas To Innovation I
- General Education Elective I - Credit Hours: 3.00

- ENGL 10600 - First-Year Composition
  or
- ENGL 10800 - Accelerated First-Year Composition

16-17 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II

- PHYS 17200 - Modern Mechanics
- FYE Science Selective - Credit Hours: 3.00
- ENGR 13200 - Transforming Ideas To Innovation II
- COM 11400 - Fundamentals Of Speech Communication

16 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus
- PHYS 24100 - Electricity And Optics
- CE 29700 - Basic Mechanics I (Statics)
- CE 20300 - Principles And Practice Of Geomatics
- CGT 16400 - Graphics For Civil Engineering And Construction
- CE 29202 - Contemporary Issues In Civil Engineering

18 Credits

Spring 2nd Year

- MA 26500 - Linear Algebra
- CE 23100 - Engineering Materials I
- CE 27000 - Introductory Structural Mechanics
- CE 29800 - Basic Mechanics II Dynamics
- General Education Elective II - Credit Hours: 3.00

16 Credits

Fall 3rd Year

- MA 26600 - Ordinary Differential Equations
- CE 33100 - Engineering Materials II
- CE 34000 - Hydraulics
- CE 34300 - Elementary Hydraulics Laboratory
- Technical Elective I (Breadth) - Credit Hours: 3.00
- General Education Elective III - Credit Hours: 3.00

16 Credits

Spring 3rd Year

- STAT 51100 - Statistical Methods
- CE 39800 - Introduction To Civil Engineering Systems Design
- CE 39201 - Technical Communication In Civil Engineering
- Technical Elective II (Breadth) - Credit Hours: 3.00
- Technical Elective III (Design) - Credit Hours: 3.00
- Basic Science Selective - Credit Hours: 3.00

17 Credits

Fall 4th Year

- ME 20000 - Thermodynamics I
- Technical Elective IV (Breadth) - Credit Hours: 3.00
- Technical Elective V (Design) - Credit Hours: 3.00
- Technical Elective VI - Credit Hours: 3.00
- Technical Elective VII - Credit Hours: 3.00
- General Education Elective IV - Credit Hours: 3.00

18 Credits

Spring 4th Year

- CE 49800 - Civil Engineering Design Project
- Technical Elective VIII (Breadth) - Credit Hours: 3.00
- Technical Elective IX (Design) - Credit Hours: 3.00
- Technical Elective X - Credit Hours: 3.00
- General Education Elective V - Credit Hours: 3.00

15 Credits

Note

Students must have a graduation index of 2.0 and a CE index (CE courses only) of 2.0.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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Minor

Architectural Engineering Minor

18 Required Credits

A Minor in Architectural Engineering is available to all students in the College of Engineering except students in the School of Civil Engineering.

The Minor is focused on high performance buildings.

Requirements for the Minor

Required Courses (12 credits)

- CE 31100 - Architectural Engineering
- CE 41300 - Building Envelope Design And Thermal Loads
- CE 41400 - Building Mechanical And Electrical System Design
- CE 51300 - Lighting In Buildings

Elective Courses - Choose 2 (6 credits)

- CE 37100 - Structural Analysis I
- CE 47900 - Design Of Building Components And Systems
- CE 51401 - Building Controls
- CE 51501 - Building Energy Audits
- CE 59700 - Civil Engineering Projects (Sustainable Building Design, Construction and Operation)
- ME 51800 - Analysis Of Thermal Systems
- ME 59700 - Advanced Mechanical Engineering Projects I (Solar Energy Engineering)

Notes

Must have a grade of "C" or better in all of the courses.

A grade of "C- or lower" in any of the above courses is not adequate to fulfill the Minor.

All of the above prescribed minor courses must be taken at the Purdue West Lafayette campus.

Disclaimer

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

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Division of Construction Engineering and Management

About Construction Engineering and Management

The Division of Construction Engineering and Management (CEM) offers a degree in Construction Engineering (BSCNE) which is tailored to prepare graduates for professional work in the construction industry. The Construction Engineering curriculum includes about 80 percent engineering courses and 20 percent management courses focused on the knowledge necessary for construction careers.

Construction engineers design and execute processes for building and maintaining the infrastructure of our world. The tools of the trade for today's successful construction engineer include the following: strong math, science, and computer skills; creativity; an aptitude for applying science and engineering methods to solve problems; a love of building structures such as bridges, airports, buildings, dams, and highways; an interest in working indoors and outdoors; initiative and a strong work ethic; the ability to collaborate with diverse people; good communications skills; and a desire to learn in a constantly changing environment. Students in the Construction Engineering program have the opportunity to develop additional expertise in mechanical, electrical, and other areas of engineering through minors in these fields. Construction Engineering students complete three 12-week paid internships, usually during the summer and away from home. They work as paid employees of construction contractors and construction managers and perform increasingly responsible duties in field operations, office operations, and project management

For over 18 years in a row BSCNE graduates have been hired at a 100-percent rate upon graduation by some of the 100 top U.S. construction firms.

Many construction engineers move into senior management, attaining executive positions and even ownership in a construction firm. These professionals have a passion for building structures and collaborating with a wide range of people, as well as a desire to learn in a constantly changing world.

Faculty

https://engineering.purdue.edu/CEM/People

Contact Information

Division of Construction Engineering and Management
Purdue University
550 Stadium Mall Drive, CIVL 1227

West Lafayette, IN 47907-2051
E-mail: CEM Information
Phone: +1 (765) 494 2240
FAX: +1 (765) 494 0644

Baccalaureate

Construction Engineering and Management, BSCNE

About the Program

The Division of Construction Engineering and Management (CEM) offers a degree in Construction Engineering (BSCNE) which is tailored to prepare graduates for professional work in the construction industry. The Construction Engineering curriculum includes about 80 percent engineering courses and 20 percent management courses focused on the knowledge necessary for construction careers.

Construction engineers design and execute processes for building and maintaining the infrastructure of our world. The tools of the trade for today's successful construction engineer include the following: strong math, science, and computer skills; creativity; an aptitude for applying science and engineering methods to solve problems; a love of building structures such as bridges, airports, buildings, dams, and highways; an interest in working indoors and outdoors; initiative and a strong work ethic; the ability to collaborate with diverse people; good communications skills; and a desire to learn in a constantly changing environment. Students in the Construction Engineering program have the opportunity to develop additional expertise in mechanical, electrical, and other areas of engineering through minors in these fields. Construction Engineering students complete three 12-week paid internships, usually during the summer and away from home. They work as paid employees of construction contractors and construction managers and perform increasingly responsible duties in field operations, office operations, and project management

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Many construction engineers move into senior management, attaining executive positions and even ownership in a construction firm. These professionals have a passion for building structures and collaborating with a wide range of people, as well as a desire to learn in a constantly changing world.

Degree Requirements

130 Credits Required

Construction Engineering Major Courses

Required CEM Courses (58 credits)

- CE 20300 - Principles And Practice Of Geomatics

- CEM 20100 - Life Cycle Engineering And Management Of Constructed Facilities
- CGT 16400 - Graphics For Civil Engineering And Construction
- CE 27000 - Introductory Structural Mechanics
- CE 23100 - Engineering Materials I
- CEM 32100 - Construction Engineering Materials Lab
- CE 29800 - Basic Mechanics II Dynamics
- CEM 30200 - Practical Applications For Construction Engineering
- CEM 32400 - Human Resource Management In Construction
- CEM 30100 - Project Control And Life Cycle Execution Of Constructed Facilities
- CE 34000 - Hydraulics
- CE 37100 - Structural Analysis I
- CE 38300 - Geotechnical Engineering I
- CEM 48500 - Legal Aspects Of Construction Engineering
- CEM 42500 - Construction Practice Project
- CE 29700 - Basic Mechanics I (Statics)
- ME 20000 - Thermodynamics I
- CE 52100 - Construction Business Management
- CE 34300 - Elementary Hydraulics Laboratory
- CE 47300 - Reinforced Concrete Design
- CEM 19100 - Construction Internship I
- CEM 29100 - Construction Internship II
- CEM 39100 - Construction Internship III

CEM technical Electives - (6 credits)

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00

Other Departmental /Program Course Requirements (48-50 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement) (Satisfies Quant Reasoning requirement)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement)

- MA 16600 - Analytic Geometry And Calculus II (satisfies FYE requirement)
  or
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies FYE requirement)

- COM 11400 - Fundamentals Of Speech Communication (Satisfies Oral Com requirement)
- MGMT 20000 - Introductory Accounting
- MA 26100 - Multivariate Calculus
- MA 26500 - Linear Algebra
- MA 26600 - Ordinary Differential Equations
- PHYS 24100 - Electricity And Optics
- STAT 51100 - Statistical Methods
- CHM 11500 - General Chemistry (satisfies FYE requirement) (Satisfies Science requirement)

- PHYS 17200 - Modern Mechanics (satisfies FYE requirement)
- ENGL 10800 - Accelerated First-Year Composition (satisfies FYE requirement) (Satisfies Oral Com & Written Com req)
- ENGR 13100 - Transforming Ideas To Innovation I (satisfies FYE requirement)
- ENGR 13200 - Transforming Ideas To Innovation II (satisfies FYE requirement)
- Science Selective (satisfies FYE requirement) - Credit Hours: 3.00

General Education Electives (18 credits)

- General Education Elective I - Credit Hours: 3.00 (Satisfies Humanities requirement)
- General Education Elective II - Credit Hours: 3.00 (Satisfies Behavior/Social Science requirement)
- General Education Elective III - Credit Hours: 3.00 (Satisfies Science, Tech & Society requirement)
- General Education Elective IV - Credit Hours: 3.00
- General Education Elective V - Credit Hours: 3.00
- General Education Elective VI (CEM 28000 & CEM 38000) - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

https://engineering.purdue.edu/CEM/Academics

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGL 10800 - Accelerated First-Year Composition
- ENGR 13100 - Transforming Ideas To Innovation I

13 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics
- Science Selective - Credit Hours: 3.00
- ENGR 13200 - Transforming Ideas To Innovation II
- COM 11400 - Fundamentals Of Speech Communication

16 Credits

Summer 1st Year

- CEM 19100 - Construction Internship I

0 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus
- CEM 20100 - Life Cycle Engineering And Management Of Constructed Facilities
- CE 29700 - Basic Mechanics I (Statics)
- CE 20300 - Principles And Practice Of Geomatics
- CGT 16400 - Graphics For Civil Engineering And Construction

16 Credits

Spring 2nd Year

- MA 26600 - Ordinary Differential Equations
- CE 23100 - Engineering Materials I
- CE 27000 - Introductory Structural Mechanics
- CEM 28000 - Construction Engineering Professional Development I
- MGMT 20000 - Introductory Accounting
- PHYS 24100 - Electricity And Optics

18 Credits

Summer 2nd Year

- CEM 29100 - Construction Internship II
- Gen Ed Elective I - Credit Hours: 3.00

3 Credits

Fall 3rd Year

- MA 26500 - Linear Algebra
- CE 29800 - Basic Mechanics II Dynamics
- CEM 30100 - Project Control And Life Cycle Execution Of Constructed Facilities
- STAT 51100 - Statistical Methods
- CEM 38000 - Construction Engineering Professional Development II
- CEM 32100 - Construction Engineering Materials Lab

14 Credits

Spring 3rd Year

- Technical Elective I - Credit Hours: 3.00
- CE 34000 - Hydraulics
- CE 34300 - Elementary Hydraulics Laboratory
- CE 37100 - Structural Analysis I
- CE 38300 - Geotechnical Engineering I
- CEM 30200 - Practical Applications For Construction Engineering

16 Credits

Summer 3rd Year

- CEM 39100 - Construction Internship III
- Gen Ed Elective II - Credit Hours: 3.00

3 Credits

Fall 4th Year

- Technical Elective II - Credit Hours: 3.00
- CE 47300 - Reinforced Concrete Design
- CEM 42500 - Construction Practice Project
- CEM 32400 - Human Resource Management In Construction
- General Education Elective III - Credit Hours: 3.00

16 Credits

Spring 4th Year

- CE 52100 - Construction Business Management
  or
- MGMT 30400 - Introduction To Financial Management

- ME 20000 - Thermodynamics I
- CEM 48500 - Legal Aspects Of Construction Engineering
- General Education Elective IV - Credit Hours: 3.00
- General Education Elective V - Credit Hours: 3.00

15 Credits

Note

Students must have a graduation index of 2.0.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

Minor

Construction Engineering Minor

15 Credits Required

Requirements for the Minor

Required Courses (6 credits)

- CEM 20100 - Life Cycle Engineering And Management Of Constructed Facilities
- CEM 19100 - Construction Internship I [2]
- CEM 30100 - Project Control And Life Cycle Execution Of Constructed Facilities
- CEM 29100 - Construction Internship II [2,3]

Elective Courses (9 credits)

- CEM 30200 - Practical Applications For Construction Engineering
- CEM 32400 - Human Resource Management In Construction
- CEM 45500 - Temporary Structures In Construction
- CEM 48500 - Legal Aspects Of Construction Engineering
- CEM 49700 - Construction Engineering Projects
- CE 300-level or above[4] -Courses related to construction must be submitted to the Chair of the Undergraduate Curriculum Committee for CEM.

Notes

Interested students should contact the Director of Internships at cem@purdue.edu

This minor is available to students in the College of Engineering.

Courses must be completed with a grade of "C-" or better.

No more than one substitution from either of the above two categories is acceptable to be eligible for the Construction Engineering Minor. All courses must be taken for a grade; therefore, a transfer course must meet University guidelines for appropriate transfer of grade.

Students may not be on academic probation to enroll in upper division work.

Generally, all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus to be eligible for the Construction Engineering Minor. The only exceptions to this rule are as follows:

1. One equivalent transfer course from another university can be used for an elective if the course is from an Engineering ABET-accredited program, OR
2. One equivalent Purdue substitution may be used if it is deemed equivalent to the prescribed minor course and acceptable by the Chair of the Undergraduate Curriculum Committee for the Division of Construction Engineering and Management (CEM).

[1]Exception: A student enrolled in the School of Civil Engineering cannot seek a Minor in Construction Engineering.

[2]The internship shall be arranged by the student and approved by the Director of Internships for CEM.

[3] An equivalent professional or research experience approved by the Chair of the Undergraduate Curriculum Committee for CEM.

[4]Courses (or topics) that satisfy this requirement may have a prerequisite. The student should consult the academic advisor in advance.

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School of Electrical and Computer Engineering

About Electrical and Computer Engineering

Electrical and Computer engineering encompasses all areas of research, development, design, and operation of electrical and electronic systems and their components, including software. Emphasis in such varied areas as bioengineering, circuit theory, communication sciences, computers and automata, control systems, electromagnetic fields, energy sources and systems, and materials and electronic devices is available. Two degree programs are offered by the School: Bachelor of Science in Electrical Engineering (BSEE) and Bachelor of Science in Computer Engineering (BSCmpE).

Engineers in both fields must have a strong background in mathematics and physics, a broad base in the humanities, and a command of the English language in order to provide the scope of knowledge essential for optimum professional growth. The curriculum offered by the School of Electrical and Computer Engineering meets these objectives.

Graduates from the School of Electrical and Computer Engineering are sought after by all major industries. Electrical engineers hold many unusual and challenging positions in the aerospace, chemical, nuclear, automotive, medical, metallurgical, textile, railway, petroleum, and other basically non-electrical industries, as well as in computers, electronics, communications, power, and other electrical industries. Their professional roles span industrial activity, research, development, design, production, marketing, operation, field testing, and maintenance of many types of equipment for government, industry, farm, and home.

Two degree programs are offered by the school:

Electrical Engineering encompasses the development, design, research, and operation of electrical and electronic systems and components. Disciplines include VLSI and circuit design, communication and signal processing, computer engineering, automatic control, fields and optics, energy sources and systems, and microelectronics and nanotechnology.

Computer Engineering is a specialization within electrical and computer engineering offering an in-depth education in both hardware and software aspects of modern computer systems.

Electrical and Computer Engineering provides students with a versatile education that will prove valuable looking toward a professional future. Along with problem-solving and design skills, students develop a strong foundation in math, science, and core electrical/computer engineering fundamentals. This skillset prepares them for research and development positions in industry, management, sales, teaching, medical school, and law school.

At Birck Nanotechnology Center, engineers and scientists conduct research in emerging fields where new materials and tiny structures are built atom by atom or molecule by molecule.

Faculty

https://engineering.purdue.edu/ECE/People/Faculty

Contact Information

Purdue University
School of Electrical and Computer Engineering
Electrical Engineering Building
465 Northwestern Ave.
West Lafayette, Indiana 47907-2035
ph (765) 494-3540

Graduate Information

For Graduate Information please see Electrical and Computer Engineering Graduate Program Information.

Baccalaureate

Computer Engineering, BSCMPE

About the Program

Electrical and Computer engineering encompasses all areas of research, development, design, and operation of electrical and electronic systems and their components, including software. Emphasis in such varied areas as bioengineering, circuit theory, communication sciences, computers and automata, control systems, electromagnetic fields, energy sources and systems, and materials and electronic devices is available. Two degree programs are offered by the School: Bachelor of Science in Electrical Engineering (BSEE) and Bachelor of Science in Computer Engineering (BSCmpE).

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At Birck Nanotechnology Center, engineers and scientists conduct research in emerging fields where new materials and tiny structures are built atom by atom or molecule by molecule.

Degree Requirements

125 Credits Required

Major Courses (49 credits)

(An overall 2.000 cumulative GPA or better in these courses is required)

Required ECE Courses (35 credits)

- ECE 20000 - Electrical And Computer Engineering Seminar
- ECE 20100 - Linear Circuit Analysis I
- ECE 20200 - Linear Circuit Analysis II
- ECE 20700 - Electronic Measurement Techniques
- ECE 20800 - Electronic Devices And Design Laboratory
- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 26400 - Advanced C Programming
- ECE 27000 - Introduction To Digital System Design
- ECE 30100 - Signals And Systems
- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- ECE 33700 - ASIC Design Laboratory
- ECE 36200 - Microprocessor Systems And Interfacing
- ECE 36400 - Software Engineering Tools Laboratory
- ECE 36800 - Data Structures
- ECE 40000 - Professional Development And Career Guidance

Advanced CmpE Requirement (8 credits)

- ECE 43700 - Computer Design And Prototyping
  and
- ECE 46800 - Introduction To Compilers And Translation Engineering
  or
- ECE 46900 - Operating Systems Engineering

Senior Design (3-4 credits)

- ECE 47700 - Digital Systems Senior Project
  or
- ECE 49022 - Electrical Engineering Senior Design Projects
  or
- EPCS 41100 - Senior Design Participation In EPICS (2 consecutive semesters)
  and/or
- EPCS 41200 - Senior Design Participation In EPICS (2 consecutive semesters)

Computer Engineering Selective (2-3 credits)

Select from the attached list of courses.

Other Department/Program Course Requirements (76 credits)

General Engineering Requirement (10 credits)

- ENGR 13100 - Transforming Ideas To Innovation I
- ENGR 13200 - Transforming Ideas To Innovation II
- CS 15900 - Programming Applications For Engineers

Engineering Breadth Selective - Select one of:

- AAE 20300 - Aeromechanics I
- BME 20100 - Biomolecules: Structure, Function, And Engineering Applications
- CE 29700 - Basic Mechanics I (Statics)
- CE 35000 - Introduction To Environmental And Ecological Engineering
- CE 35300 - Physico-Chemical Principles Of Environmental Engineering
- CE 35500 - Engineering Environmental Sustainability
- CHE 20500 - Chemical Engineering Calculations
- EEE 35500 - Engineering Environmental Sustainability
- IE 33500 - Operations Research - Optimization
- IE 33600 - Operations Research - Stochastic Models
- ME 20000 - Thermodynamics I
- ME 27000 - Basic Mechanics I
- ME 41300 - Noise Control
- MSE 23000 - Structure And Properties Of Materials
- NUCL 20000 - Introduction to Nuclear Engineering

Mathematics Requirement (21-22 credits)

Choose one of the following 2 options:

Option 1 (21 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Foundational Outcome of the University Core)

- ECE 36900 - Discrete Mathematics For Computer Engineering
- MA 16600 - Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- MA 26500 - Linear Algebra
- MA 26600 - Ordinary Differential Equations

Option 2 (22 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Foundational Outcome of the University Core)
- ECE 36900 - Discrete Mathematics For Computer Engineering
- MA 16600 - Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- MA 26200 - Linear Algebra And Differential Equations

Advanced Math Selective - Select one of:

- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences
- MA 30400 - Differential Equations And Analysis Of Nonlinear Systems For Engineering And The Sciences
- MA 38500 - Introduction To Logic
- MA 42500 - Elements Of Complex Analysis
- MA 51000 - Vector Calculus
- CS 31400 - Numerical Methods

Science Requirement (15-16 credits)

- CHM 11500 - General Chemistry (satisfies Science Foundational Outcome of the University Core)
- PHYS 17200 - Modern Mechanics (satisfies Science Foundational Outcome of the University Core)
- PHYS 27200 - Electric And Magnetic Interactions

Science Selective - Select one of:

- BIOL 11000 - Fundamentals Of Biology I
- BIOL 11100 - Fundamentals Of Biology II
- CHM 11600 - General Chemistry
- CHM 12400 - General Chemistry For Engineers II
- PHYS 31000 - Intermediate Mechanics
- PHYS 32200 - Intermediate Optics
- PHYS 34200 - Modern Physics
- PHYS 34400 - Modern Physics

ECE General Education Requirement (24 credits)

While a comprehensive understanding of science and mathematics is central and foundational to effective engineering practice, real-world engineering problems are both complex and situated within dynamic social, political, and cultural contexts. Therefore, well-rounded engineering curricula must also include courses that encompass the breadth of human experience and culture, both past and present. Such courses may include, but are not limited to, those that explore individual behavior, social and political structures, aesthetic values, modes and dynamics of communication, philosophical and ethical thought, and cognitive processes. These types of courses provide engineering students with a framework for rational inquiry, critical evaluation, and judgment when dealing with issues that are non-quantifiable, ambiguous, and/or controversial. In addition, they offer engineering students

the opportunity to develop interests and insights that will deepen their appreciation for the diversity of the world in which they live and work.

Based on these premises, the goals of the ECE General Education Program are to

- Provide the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- Support and complement the technical content of the engineering curricula through coursework that emphasizes such skills as written communication, oral communication, information literacy, cultural awareness, leadership, innovation, entrepreneurship, and managing change.

These goals are consistent with the objectives of the College of Engineering's Engineer of 2020 initiative (Engineering Faculty Document 15-06), as well as the objectives of Purdue University's Undergraduate Outcomes-Based Curriculum (University Senate Document 11-7).

To these ends, all B.S. students in Electrical and Computer Engineering are required to complete the ECE General Education Program described below. This program is consistent with the College of Engineering General Education Program (Engineering Faculty Documents 43-13 and 39-14).

Foundational Learning Outcomes

Students must select from the list of courses approved by the University Curriculum Council (UCC) to satisfy each of the following six Foundational Learning Outcomes of the Universiy Core Requirements (see below) - the Science and Quantitative Reasoning Foundational Outcomes are satisfied elsewhere in the BSCMPE curriculum. Some courses may have been approved to meet more than one of the Foundational Learning Outcomes, so fewer than six courses can be used to fulfill this condition. There is no minimum number of credit hours needed to satisfy this component of the College of Engineering General Education Program. If a course taken to fulfill some other EE/CmpE degree requirement has also been approved as satisfying one or more of these Engineering Foundational Learning Outcomes, then those Engineering Foundational Learning Outcomes need not be satisfied again within the ECE General Education Program. The pertinent Foundational Learning Outcomes are defined as follows:

- Written Communication
- Oral Communication
- Human Cultures: Humanities
- Human Cultures: Behavioral/Social Science
- Science, Technology & Society

ECE General Education Electives

Students must take additional approved courses to reach the minimum requirement of 24 credit hours. These courses must be drawn from those offered by the departments of Agricultural Economics, Speech, Language, and Hearing Sciences, Child Development and Family Studies, Communication, Economics, English, Entrepreneurship, Foreign Languages and Literatures, History, Interdisciplinary Studies, Management, Philosophy, Political Sciences, Psychological Sciences, Sociology and Anthropology, Visual and Performing Arts. Any course offered by these departments is allowable, provided that it is open to students in the offering department and is not focused primarily on professional training, natural science or mathematics. Other courses, as approved by the ECE Curriculum Committee, may also be selected. The list of approved courses is attached.

Advanced Level General Education Requirement

At least 6 credit hours must come from courses at the 30000-level or above, or from courses with a required prerequisite in the same department.

Educational Diversity Requirement

At least 12 credit hours must be taken from the College of Liberal Arts, the Krannert School of Management, and/or the Honors College - provided such courses are not focused primarily on engineering, technology, the natural sciences, or mathematics.

Complimentary Electives (4-6 credits)

Choose additional coursework to bring total credits to the minimum 125 required for the BSEE degree. Students should carefully select these courses to complement their personal interests and their academic record.

Applicable Complementary Electives

- Any course that would otherwise satisfy a specific degree requirement (i.e., ECE Requirements, General Engineering, Mathematics Requirement, Science Requirement, and General Education Requirement), but is in excess of the minimum credits for that requirement, can be used as a Complementary Elective.
- ECE 19000 taken prior to acceptance into ECE.
- Courses taken to satisfy a minor requirement (unless that course is excluded below).
- One (1) credit per semester of ROTC, up to a maximum of six (6) credit hours.
- One (1) credit per semester of BAND, up to a maximum of six (6) credit hours.
- 2 credits of CGT taken while enrolled in FYE.
- Exploratory FYE (ENGR) courses.
- Seminar courses, including FYE seminars [limited to 3 credit hours]
- Activity courses (such as Engineering Ambassadors and First Robotics) [only a single instance of the course is applicable].
- Up to 2 credits total in two different PES courses [no more than 1 credit per course is applicable]
- Courses explicitly approved by the ECE Curriculum Committee.

Exclusions

- pre-calculus Mathematics (MA) courses.
- Statistics (STAT) courses without a calculus prerequisite.
- CS courses not intended for engineering students - for example, CS 11000.
- General Studies (GS) courses (however, credit for GS 10000 and GS 10100 are accepted as ECE General Education Electives).
- Courses from the College of Technology that have not been specifically approved by the ECE Curriculum Committee.
- Courses from the College of Health and Human Sciences that have not been specifically approved by the ECE Curriculum Committee.
- Courses from the College of Education that have not been specifically approved by the ECE Curriculum Committee.

  [Note: UCC approved courses will still satisfy the University Core, but the credit hours are not applicable to BSEE degree requirements]

<u>Excluded Courses</u>

Some courses specifically excluded as complementary electives (not a comprehensive list):

- CS 11000

- CS 17700
- ECE 19000 taken after admission into ECE
- MGMT 20010
- STAT 11300 (IL Foundational Outcome satisfied, but credit hours are not applied to degree requirements)
- STAT 30100 (IL Foundational Outcome satisfied, but credit hours are not applied to degree requirements)

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Degree Requirements

Select Approved Computer Engineering Electives, ECE General Education Electives, or Pass-No Pass for additional lists.

Program Requirements

The following is an example of a 4-year plan that satisfies the BSCMPE degree requirements.

Fall 1st Year

- ENGR 13100 - Transforming Ideas To Innovation I
- MA 16500 - Analytic Geometry And Calculus I
- CS 15900 - Programming Applications For Engineers
- Oral Communication Foundational Outcome - Credit Hours: 3.00 *
- CHM 11500 - General Chemistry *

16 Credits

Spring 1st Year

- ENGR 13200 - Transforming Ideas To Innovation II

- PHYS 17200 - Modern Mechanics *
- MA 16600 - Analytic Geometry And Calculus II
- Foundational Gen Ed - Credit Hours: 3.00 *
- Written Communication Foundational Outcome - Credit Hours: 3.00 *

16 Credits

Fall 2nd Year

- ECE 20000 - Electrical And Computer Engineering Seminar
- ECE 20700 - Electronic Measurement Techniques
- ECE 20100 - Linear Circuit Analysis I ♦
- ECE 26400 - Advanced C Programming ♦
- MA 26100 - Multivariate Calculus ♦
- PHYS 27200 - Electric And Magnetic Interactions

15 Credits

Spring 2nd Year

- ECE 20200 - Linear Circuit Analysis II
- ECE 27000 - Introduction To Digital System Design ♦
- ECE 36800 - Data Structures
- MA 26600 - Ordinary Differential Equations
- ECE Science Selective - Credit Hours: 3.00

16 Credits

Fall 3rd Year

- ECE 20800 - Electronic Devices And Design Laboratory
- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 30100 - Signals And Systems
- ECE 36200 - Microprocessor Systems And Interfacing
- ECE 40000 - Professional Development And Career Guidance
- Foundational Gen Ed - Credit Hours: 3.00 *

15 Credits

Spring 3rd Year

- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- ECE 33700 - ASIC Design Laboratory
- ECE 36400 - Software Engineering Tools Laboratory
- ECE 36900 - Discrete Mathematics For Computer Engineering
- Foundational GenEd - Credit Hours: 3.00 *
- Foundational GenEd - Credit Hours: 3.00 *

15 Credits

Fall 4th Year

- ECE 43700 - Computer Design And Prototyping
  or
- ECE 46800 - Introduction To Compilers And Translation Engineering

- ECE 47700 - Digital Systems Senior Project
- MA 26500 - Linear Algebra
- Complementary Elective - Credit Hours: 3.00
- ECE Gen Ed Elective - Credit Hours: 3.00

17 Credits

Spring 4th Year

- ECE 43700 - Computer Design And Prototyping
  or
- ECE 46900 - Operating Systems Engineering

- Computer Engineering Elective - Credit Hours: 2.00
- Engr. Breadth Elective - Credit Hours: 3.00
- ECE Gen Ed Elective - Credit Hours: 3.00
- Complimentary Elective - Credit Hours: 3.00

15 Credits

Notes

* Satisfies a University Core Requirement

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

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

Electrical Engineering, BSEE

About the Program

Electrical and Computer engineering encompasses all areas of research, development, design, and operation of electrical and electronic systems and their components, including software. Emphasis in such varied areas as bioengineering, circuit theory, communication sciences, computers and automata, control systems, electromagnetic fields, energy sources and systems, and materials and electronic devices is available. Two degree programs are offered by the School: Bachelor of Science in Electrical Engineering (BSEE) and Bachelor of Science in Computer Engineering (BSCmpE).

Engineers in both fields must have a strong background in mathematics and physics, a broad base in the humanities, and a command of the English language in order to provide the scope of knowledge essential for optimum professional growth. The curriculum offered by the School of Electrical and Computer Engineering meets these objectives.

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Two degree programs are offered by the school:

Electrical Engineering encompasses the development, design, research, and operation of electrical and electronic systems and components. Disciplines include VLSI and circuit design, communication and signal processing, computer engineering, automatic control, fields and optics, energy sources and systems, and microelectronics and nanotechnology.

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Electrical and Computer Engineering provides students with a versatile education that will prove valuable looking toward a professional future. Along with problem-solving and design skills, students develop a strong foundation in math, science, and core electrical/computer engineering fundamentals. This skillset prepares them for research and development positions in industry, management, sales, teaching, medical school, and law school.

At Birck Nanotechnology Center, engineers and scientists conduct research in emerging fields where new materials and tiny structures are built atom by atom or molecule by molecule.

Degree Requirements

124 Credits Required

Major Courses (47 credits)

(An overall 2.000 cumulative GPA or better in these courses is required)

Required ECE Courses (25 credits)

- ECE 20000 - Electrical And Computer Engineering Seminar
- ECE 20100 - Linear Circuit Analysis I
- ECE 20200 - Linear Circuit Analysis II
- ECE 20700 - Electronic Measurement Techniques
- ECE 20800 - Electronic Devices And Design Laboratory
- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 27000 - Introduction To Digital System Design
- ECE 30100 - Signals And Systems
- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- ECE 31100 - Electric And Magnetic Fields
- ECE 40000 - Professional Development And Career Guidance

Adv. EE Selectives - Select three (3) of the following courses (9 - 11 credits)

- ECE 30500 - Semiconductor Devices
- ECE 32100 - Electromechanical Motion Devices
- ECE 36200 - Microprocessor Systems And Interfacing
- ECE 38200 - Feedback System Analysis And Design

- ECE 43800 - Digital Signal Processing With Applications
  or
- ECE 44000 - Transmission Of Information

Senior Design (3 - 4 credits)

- ECE 49022 - Electrical Engineering Senior Design Projects
  or
- ECE 47700 - Digital Systems Senior Project
  or
- EPCS 41100 - Senior Design Participation In EPICS 2 consecutive semesters
  and/or
- EPCS 41200 - Senior Design Participation In EPICS 2 consecutive semesters

Electrical Engineering Electives (7 - 10 credits)

- Additional approved ECE courses to bring total ECE credit hours to at least 47.
- Must include at least three (3) Advanced-Level laboratory courses or ECE courses with laboratory components. Courses with laboratory components taken as Advanced EE Selectives (ECE 36200, ECE 43800 and ECE 44000) also contribute to the Advanced-Level Laboratory requirement. No more than two (2) of these labs may be EE Special Content courses.
- No more than 6 credit hours of EE Special Content (as designated by the ECE Curriculum Committee) courses can be used towards the 47 credit hours of Major Courses.
- See attached list of courses.

Other Department/Program Course Requirements (77 credits)

General Engineering Requirement (10 credits)

- ENGR 13100 - Transforming Ideas To Innovation I
- ENGR 13200 - Transforming Ideas To Innovation II
- CS 15900 - Programming Applications For Engineers

Engineering Breadth Selective - Select one of:

- AAE 20300 - Aeromechanics I
- BME 20100 - Biomolecules: Structure, Function, And Engineering Applications
- CE 29700 - Basic Mechanics I (Statics)
- CE 35000 - Introduction To Environmental And Ecological Engineering
- CE 35300 - Physico-Chemical Principles Of Environmental Engineering
- CE 35500 - Engineering Environmental Sustainability
- CHE 20500 - Chemical Engineering Calculations
- EEE 35500 - Engineering Environmental Sustainability
- IE 33500 - Operations Research - Optimization
- IE 33600 - Operations Research - Stochastic Models
- ME 20000 - Thermodynamics I
- ME 27000 - Basic Mechanics I
- ME 41300 - Noise Control
- MSE 23000 - Structure And Properties Of Materials
- NUCL 20000 - Introduction to Nuclear Engineering

Mathematics Requirement (18 - 19 credits)

Choose one of the following 2 options:

Option 1 (18 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Foundational Outcome of the University Core)
- MA 16600 - Analytic Geometry And Calculus II

- MA 26100 - Multivariate Calculus
- MA 26500 - Linear Algebra
- MA 26600 - Ordinary Differential Equations

Option 2 (19 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Foundational Outcome of the University Core)
- MA 16600 - Analytic Geometry And Calculus II
- MA 26100 - Multivariate Calculus
- MA 26200 - Linear Algebra And Differential Equations

Advanced Math Selective - Select one of:

- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences
- MA 35100 - Elementary Linear Algebra
- MA 38500 - Introduction To Logic
- MA 42500 - Elements Of Complex Analysis
- MA 51000 - Vector Calculus
- CS 31400 - Numerical Methods

Science Requirement (15 - 16 credits)

- CHM 11500 - General Chemistry (satisfies Science Foundational Outcome of the University Core)
- PHYS 17200 - Modern Mechanics (satisfies Science Foundational Outcome of the University Core)
- PHYS 27200 - Electric And Magnetic Interactions

Science Selective - Select one of:

- BIOL 11000 - Fundamentals Of Biology I
- BIOL 11100 - Fundamentals Of Biology II
- CHM 11600 - General Chemistry
- CHM 12400 - General Chemistry For Engineers II
- PHYS 31000 - Intermediate Mechanics
- PHYS 32200 - Intermediate Optics
- PHYS 34200 - Modern Physics
- PHYS 34400 - Modern Physics

ECE General Education Requirement (24 credits)

While a comprehensive understanding of science and mathematics is central and foundational to effective engineering practice, real-world engineering problems are both complex and situated within dynamic social, political, and cultural contexts. Therefore, well-rounded engineering curricula must also include courses that encompass the breadth of human experience and culture, both past and present. Such courses may include, but are not limited to, those that explore individual behavior, social and political structures, aesthetic values, modes and dynamics of communication, philosophical and ethical thought, and cognitive processes. These types of courses provide engineering students with a framework for rational inquiry, critical evaluation, and judgment when dealing with issues that are non-quantifiable, ambiguous, and/or controversial. In addition, they offer engineering students the opportunity to develop interests and insights that will deepen their appreciation for the diversity of the world in which they live and work.

Based on these premises, the goals of the ECE General Education Program are to

- Provide the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- Support and complement the technical content of the engineering curricula through coursework that emphasizes such skills as written communication, oral communication, information literacy, cultural awareness, leadership, innovation, entrepreneurship, and managing change.

These goals are consistent with the objectives of the College of Engineering's Engineer of 2020 initiative (Engineering Faculty Document 15-06), as well as the objectives of Purdue University's Undergraduate Outcomes-Based Curriculum (University Senate Document 11-7).

To these ends, all B.S. students in Electrical and Computer Engineering are required to complete the ECE General Education Program described below. This program is consistent with the College of Engineering General Education Program (Engineering Faculty Documents 43-13 and 39-14).

Foundational Learning Outcomes

Students must select from the list of courses approved by the University Curriculum Council (UCC) to satisfy each of the following six Foundational Learning Outcomes of the Universiy Core Requirements (see below) - the Science and Quantitative Reasoning Foundational Outcomes are satisfied elsewhere in the BSEE curriculum. Some courses may have been approved to meet more than one of the Foundational Learning Outcomes, so fewer than six courses can be used to fulfill this condition. There is no minimum number of credit hours needed to satisfy this component of the College of Engineering General Education Program. If a course taken to fulfill some other EE/CmpE degree requirement has also been approved as satisfying one or more of these Engineering Foundational Learning Outcomes, then those Engineering Foundational Learning Outcomes need not be satisfied again within the ECE General Education Program. The pertinent Foundational Learning Outcomes are defined as follows:

- Written Communication
- Oral Communication
- Human Cultures: Humanities
- Human Cultures: Behavioral/Social Science
- Science, Technology & Society

ECE General Education Electives

Students must take additional approved courses to reach the minimum requirement of 24 credit hours. These courses must be drawn from those offered by the departments of Agricultural Economics, Speech, Language, and Hearing Sciences, Child Development and Family Studies, Communication, Economics, English, Entrepreneurship, Foreign Languages and Literatures, History, Interdisciplinary Studies, Management, Philosophy, Political Sciences, Psychological Sciences, Sociology and Anthropology, Visual and Performing Arts. Any course offered by these departments is allowable, provided that it is open to students in the offering department and is not focused primarily on professional training, natural science or mathematics. Other courses, as approved by the ECE Curriculum Committee, may also be selected. The list of approved courses is attached.

Advanced Level General Education Requirement

At least 6 credit hours must come from courses at the 30000-level or above, or from courses with a required prerequisite in the same department.

Educational Diversity Requirement

At least 12 credit hours must be taken from the College of Liberal Arts, the Krannert School of Management, and/or the Honors College - provided such courses are not focused primarily on engineering, technology, the natural sciences, or mathematics.

Complimentary Electives (8 - 10 credits)

Choose additional coursework to bring total credits to the minimum 124 required for the BSEE degree. Students should carefully select these courses to complement their personal interests and their academic record.

Applicable Complementary Electives

- Any course that would otherwise satisfy a specific degree requirement (i.e., ECE Requirements, General Engineering, Mathematics Requirement, Science Requirement, and General Education Requirement), but is in excess of the minimum credits for that requirement, can be used as a Complementary Elective.
- ECE 19000 taken prior to acceptance into ECE.
- Courses taken to satisfy a minor requirement (unless that course is excluded below).
- One (1) credit per semester of ROTC, up to a maximum of six (6) credit hours.
- One (1) credit per semester of BAND, up to a maximum of six (6) credit hours.
- 2 credits of CGT taken while enrolled in FYE.
- Exploratory FYE (ENGR) courses.
- Seminar courses, including FYE seminars [limited to 3 credit hours]
- Activity courses (such as Engineering Ambassadors and First Robotics) [only a single instance of the course is applicable].
- Up to 2 credits total in two different PES courses [no more than 1 credit per course is applicable]
- Courses explicitly approved by the ECE Curriculum Committee.

Exclusions

- pre-calculus Mathematics (MA) courses.
- Statistics (STAT) courses without a calculus prerequisite.
- CS courses not intended for engineering students - for example, CS 11000.
- General Studies (GS) courses (however, credit for GS 10000 and GS 10100 are accepted as ECE General Education Electives).
- Courses from the College of Technology that have not been specifically approved by the ECE Curriculum Committee.
- Courses from the College of Health and Human Sciences that have not been specifically approved by the ECE Curriculum Committee.
- Courses from the College of Education that have not been specifically approved by the ECE Curriculum Committee. [Note: UCC approved courses will still satisfy the University Core, but the credit hours are not applicable to BSEE degree requirements]

Excluded Courses

Some courses specifically excluded as complementary electives (not a comprehensive list):

- CS 11000
- CS 17700
- ECE 19000 taken after admission into ECE

- MGMT 20010
- STAT 11300 (IL Foundational Outcome satisfied, but credit hours are not applied to degree requirements)
- STAT 30100 (IL Foundational Outcome satisfied, but credit hours are not applied to degree requirements)

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Degree Requirements

Select ECE General Education Electives, Electrical Engineering Electives, and Pass-No Pass for course lists.

Program Requirements

The following is an example of a 4-year plan that satisfies the BSEE degree requirements.

Fall 1st Year

- ENGR 13100 - Transforming Ideas To Innovation I
- MA 16500 - Analytic Geometry And Calculus I *
- CHM 11500 - General Chemistry *
- CS 15900 - Programming Applications For Engineers
- Written Communication Foundational Outcome - Credit Hours: 3.00 *

16 Credits

Spring 1st Year

- ENGR 13200 - Transforming Ideas To Innovation II
- PHYS 17200 - Modern Mechanics *
- MA 16600 - Analytic Geometry And Calculus II

- Foundational GenEd - Credit Hours: 3.00 *
- Oral Communication Foundational Outcome - Credit Hours: 3.00 *

16 Credits

Fall 2nd Year

- ECE 20000 - Electrical And Computer Engineering Seminar
- ECE 20100 - Linear Circuit Analysis I
- ECE 20700 - Electronic Measurement Techniques
- PHYS 27200 - Electric And Magnetic Interactions
- Foundational GenEd - Credit Hours: 3.00 *
- MA 26100 - Multivariate Calculus

15 Credits

Spring 2nd Year

- ECE 20200 - Linear Circuit Analysis II
- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 20800 - Electronic Devices And Design Laboratory
- Science Selective - Credit Hours: 3.00
- Foundational GenEd - Credit Hours: 3.00 *
- MA 26600 - Ordinary Differential Equations

16 Credits

Fall 3rd Year

- ECE 30100 - Signals And Systems
- ECE 27000 - Introduction To Digital System Design
- ECE 40000 - Professional Development And Career Guidance
- Complimentary Ele - Credit Hours: 3.00
- Adv. EE Selective - Credit Hours: 3.00

14 Credits

Spring 3rd Year

- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- ECE 31100 - Electric And Magnetic Fields
- Adv. EE Selective - Credit Hours: 3.00
- ECE Elective [Adv.Lab] - Credit Hour: 1.00
- Foundational GenEd - Credit Hours: 3.00 *
- MA 26500 - Linear Algebra

16 Credits

Fall 4th Year

- ECE 49022 - Electrical Engineering Senior Design Projects
- ECE Elective - Credit Hours: 3.00
- Engr. Breadth Elective - Credit Hours: 3.00
- ECE GenEd Elective - Credit Hours: 3.00
- Complimentary Ele. - Credit Hours: 3.00

16 Credits

Spring 4th Year

- Adv. EE Selective w/Adv Lab - Credit Hours: 4.00
- ECE Elective w/Adv Lab - Credit Hours: 4.00
- ECE GenEd Elective - Credit Hours: 3.00
- Complimentary Ele. - Credit Hours: 4.00

15 Credits

Notes

* Satisfies a University Core Requirement

2.0 Graduation GPA required for Bachelor of Science degree.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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Minor

Electrical and Computer Engineering Minor

17 Credits Required

All Majors Except BME

Requirements for a minor in Electrical and Computer Engineering (only for students not majoring in Biomedical Engineering)

- Before applying for an ECE minor, *(application must be made in person in EE 136. Call 765-494-3390 for an appointment),* students must have completed MA 16500, MA 16600, and PHYS 17200 (or their equivalents) with a 'C-' grade or better in each. If the application is approved, a minor in Electrical and Computer Engineering will be granted upon completion of the following 17 credit hours of coursework.
- All requisites for these courses must be met (non-engineering students may apply for a prerequisite override for ENGR 13100 in ECE 20100) in order to enroll in these courses. Click the link for each course to see the required requisites.
- Transfer credit may be accepted for up to two of the "Required Courses" (this includes IUPUI, the regional campuses, and study abroad credit).
- A minimum overall GPA of 2.0 is required in ECE courses to qualify for the minor. Approval of the ECE minor may be revoked if the ECE GPA falls below 2.0.
- Enrollment in all ECE courses is subject to space availability. Students requesting space in restricted ECE courses must submit an application and may need to wait until 'Open Enrollment' to register. Electrical Engineering and Computer Engineering majors are given priority.

Required Courses (13 credits)

- ECE 20100 - Linear Circuit Analysis I
- ECE 20200 - Linear Circuit Analysis II
- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 27000 - Introduction To Digital System Design

Elective Course(s) (4 credits)

Choose one of the following options:

- ECE 30100 - Signals And Systems
  and
- ECE 20700 - Electronic Measurement Techniques

- ECE 30500 - Semiconductor Devices

and

- ECE 20700 - Electronic Measurement Techniques

- ECE 32100 - Electromechanical Motion Devices
  and
- ECE 20700 - Electronic Measurement Techniques

- ECE 36200 - Microprocessor Systems And Interfacing

For BME Majors Only

Requirements for a minor in Electrical and Computer Engineering (only for students majoring in Biomedical Engineering)

- Before applying for an ECE minor, *(application must be made in person in EE 136. Call 765-49-43390 for an appointment)*, students must have completed MA 16500, MA 16600, and PHYS 17200 (or their equivalents) with a 'C-' grade or better in each. If the application is approved, a minor in Electrical and Computer Engineering will be granted upon completion of the following 17-18 credit hours of coursework.
- All requisites for these courses must be met (non-engineering students may apply for a prerequisite override for ENGR 13100 in ECE 20100) in order to enroll in these courses. Click the link for each course to see the required requisites.
- Transfer credit may be accepted for up to two of the "Required Courses" (this includes IUPUI, the regional campuses, and study abroad credit).
- A minimum overall GPA of 2.0 is required in ECE courses to qualify for the minor. Approval of the ECE minor may be revoked if the ECE GPA falls below 2.0.
- Enrollment in all ECE courses is subject to space availability. Students requesting space in restricted ECE courses must submit an application and may need to wait until 'Open Enrollment' to register. Electrical Engineering and Computer Engineering majors are given priority.

Required Courses (11 credits)

- ECE 25500 - Introduction To Electronic Analysis And Design
- ECE 20800 - Electronic Devices And Design Laboratory
- ECE 27000 - Introduction To Digital System Design
- ECE 30100 - Signals And Systems

Elective Courses (2 courses)

Choose two of the following course options:

- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- ECE 30500 - Semiconductor Devices
- ECE 31100 - Electric And Magnetic Fields
- ECE 32100 - Electromechanical Motion Devices
- ECE 36200 - Microprocessor Systems And Interfacing
- ECE 43800 - Digital Signal Processing With Applications
- ECE 44100 - Distributed Parameter Systems
- ECE 45300 - Fundamentals Of Nanoelectronics
- ECE 45500 - Integrated Circuit Engineering

- ECE 51100 - Psychophysics /PSY 51100 - Psychophysics

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School of Engineering Education

The School of Engineering Education

Interdisciplinary Engineering offers two distinct degree options: Interdisciplinary Engineering Studies (IDES), and Multidisciplinary Engineering (MDE). Each degree is unique, in that they are serving student populations with different career interests. In particular, the IDES degree is often referred to as a "pre-professional school" program, which offers a bachelor of science degree (BS) and is not ABET accredited. Alternatively, the MDE degree is an ABET accredited program, conferring a bachelor of science in engineering degree (BSE). Further details of each program follow below.

The **Multidisciplinary Engineering Program's** mission, goals, objectives and outcomes are designed to prepare graduates to practice engineering. Typically, a plan of study is developed around a focused concentration. Students may develop their own individual plan of study or select one of these established, ABET-approved concentrations:

- Acoustical Engineering
- Engineering Management
- General Engineering
- Visual Design Engineering
- Lighting Engineering
- Nano-Engineering
- Humanitarian Engineering
- Theatre Engineering (Structural Schenery or Mechanical/Electrical Scenery tracts)
- Educational Engineering (not a teaching certified program)

The **Interdisciplinary Engineering Studies Program** is for students who want an engineering education but do not plan to practice engineering. Students may develop their own individual plan of study or select one of these established concentrations:

- General Engineering Studies
- Pre-Professional Engineering Studies (i.e. In preparation for a professional school: Pre-Med; Pre-Law; Pre-Vet; etc)
- Supervisory Engineering Studies
- Visual Design Engineering Studies

Detailed information on enrollment and graduation statistics for the MDE program, as well as MDE program accreditation with ABET is available for review.

Students must complete the requirements of the First-Year Engineering Program and take additional engineering courses, but may also take several courses from other schools at Purdue. Students will graduate with either a Bachelor of Science in Engineering (BSE) or a Bachelor of Science (BS) degree. Degrees from these programs offer students the opportunity to advance to graduate school or pursue a career in industry.

Features of these undergraduate programs include:

- Flexible plan of study that can be tailored to include its own title and selection of courses (with formal approval)
- Limited enrollment
- Flexible course selection (within program limits) requires careful student planning and intensive advisor counseling
- Bachelor of Science in Engineering (BSE) or Bachelor of Science (BS) degree
- Frequently Asked Questions
- Plans of Study
- Requirements
- Student Awards

Questions? Contact us by email at ide@ecn.purdue.edu or by phone at (765) 494-7422. You may also make an appointment with the MDE/IDE Advisor, by clicking: Chris Pekny

Faculty

https://engineering.purdue.edu/ENE/People/Faculty

Contact Information

School of Engineering Education
Purdue University
Neil Armstrong Hall of Engineering, Room 1300
701 W. Stadium Avenue
West Lafayette, IN 47907
e-mail: engr-info@purdue.edu
phone: (765) 494-9713
fax: (765) 494-5819

Graduate Information

For Graduate Information please see Engineering Education Graduate Program Information.

Baccalaureate

Interdisciplinary Engineering Studies, BS - Pre-Med Engineering Studies Concentration

About the Program

Interdisciplinary engineering studies (IDES) is for students who want an engineering education but do not plan to practice engineering. The program offers considerable flexibility and permits you to develop an individual plan of study to meet educational goals that require working at the interface between engineering and other disciplines. Established options in the program include pre-medical engineering studies among many others. IDES is NOT an ABET accredited program plan of study.

Link to https://engineering.purdue.edu/ENE/Academics/Undergrad

Degree Requirements

120 Credits Required

Required Engineering Courses - Selectives & Electives (30 credits)

- Economcs Selective: IE 34300 or (ECON 25100 and ECON 25200) $+^{4}$ - Credit hours: 3.00
- IDE 30100 - Professional Preparation In Interdisciplinary Engineering - Junior (Must be taken at Purdue - West Lafayette) - Credit Hours: 1.00
- Engineering Design (30000+ level): Must be approved by ENE dept. (e.g. ABE 33000, AAE 25100, CE 45600, IE 38600, etc.) - Credit Hours: 3.00
- Engineering Elective courses to meet students educational objectives: Engineering courses only) - Credit Hours: 23.00

Must Total (>=30) Credits of Engineering Coursework; **Note:** 30 credits of 20000+ level engineering courses, of which at least 15 credits are 30000+

Other Departmental /Program Course Requirements (44-50 credits)

* can be substituted with approved alternative FYE courses (i.e. ENGR 14100/14200, etc.)

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement & Quantitative Reasoning for core) or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement & Quantitative Reasoning for core)

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

- CHM 11500 - General Chemistry (satisfies FYE requirement & Science Selective for core)
- ENGR 13100 - Transforming Ideas To Innovation I (satisfies FYE requirement) *
- ENGR 13200 - Transforming Ideas To Innovation II (satisfies FYE requirement) *
- ENGL 10600 - First-Year Composition (satisfies FYE requirement & General Education & Written Comm & Info Lit for core)
- COM 11400 - Fundamentals Of Speech Communication (satisfies General Education requirement & Oral Communication for core)

- PHYS 17200 - Modern Mechanics (satisfies FYE requirement & Science Selective for core)

- CS 15900 - Programming Applications For Engineers (satisfies FYE requirement)
  or
- CHM 11600 - General Chemistry (satisfies FYE requirement)

- MA 26100 - Multivariate Calculus (satisfies math (MBSE) requirement)

- MA 26200 - Linear Algebra And Differential Equations (satisfies math (MBSE) requirement)
  or
- MA 26500 - Linear Algebra (satisfies math (MBSE) requirement)
  and
- MA 26600 - Ordinary Differential Equations (satisfies math (MBSE) requirement)

- PHYS 24100 - Electricity And Optics
  or
- PHYS 27200 - Electric And Magnetic Interactions
  or
- BIOL 11000 - Fundamentals Of Biology I
  or
- BIOL 23000 - Biology Of The Living Cell

  Statistics Selective:
- IDE 36000 - Multidisciplinary Engineering Statistics
  or
  approved equivalent (IE 23000 / 33000 / ECE 30200 / CHE32000 / STAT 35000 / STAT 51100) (if non-engineering statistics selective, it counts as MBSE; if ENGR, count as additional ENGR course)

Area Electives (29 credits maximum)

Coursework chosen to satisfy student's educational objectives - Credit Hours: 29.00

  Very highly recommended:
- CGT 11000 - Technical Graphics Communications
  or
- CGT 16300 - Graphical Communication And Spatial Analysis
  or
- CGT 16400 - Graphics For Civil Engineering And Construction

Math, Basic Science, & Engineering - MBSE (44 credits total min. from across entire POS excluding FYE)

- Engineering, CS, mathematics, or science courses as needed, *that are not used to fulfill FYE requirement*

General Education (24 credits)

NOTE: includes ENGL 106 and COM 114 (7 credits) listed above, plus 17-18 credits

- GE 1 - HSS - Credit Hours: 3.00
- GE 2 - BSS - Credit Hours: 3.00
- GE 3 - STS - Credit Hours: 3.00
- GE 4 - Credit Hours: 3.00
- GE 5 - Credit Hours: 3.00
- GE 6 - Credit Hours: 2.00 - 3.00
- ENGL 10600 - First-Year Composition
- COM 11400 - Fundamentals Of Speech Communication

Note

Minimum engineering credits = 30; Maximum AREA electives = 29; **Minimum** Math, Basic Science & Engr (MBSE) includes mathematics, CS, and engineering credits **that are not already used to fulfill FYE requirement** = 44 - more may be taken to meet program total of 120 credits. All plans of study must be approved by the School of Engineering Education. All other Purdue University graduation requirements must be satisfied.

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGL 10600 - First-Year Composition
- ENGR 13100 - Transforming Ideas To Innovation I

14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics

- CS 15900 - Programming Applications For Engineers
  or
- CHM 11600 - General Chemistry

- ENGR 13200 - Transforming Ideas To Innovation II
- COM 11400 - Fundamentals Of Speech Communication

16 - 17 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus

- PHYS 24100 - Electricity And Optics
  or
- Sci Sel - Credit Hours: 3.00 †

- Area Elective 1 †1 - Credit Hours: 3.00
- Area Elective 2 †1 - Credit Hours: 3.00
- Engineering Class 20000+ Level Elective - Credit Hours: 3.00 †2

16 Credits

Spring 2nd Year

- MA 26200 - Linear Algebra And Differential Equations
- Engineering Class 20000+ Level - Credit Hours:2.00 †2
- Engineering Class 20000+ Level Elective - Credit Hours:3.00 †2
- Area Elective 3 - Credit Hours: 3.00†1
- Area Elective 4 - Credit Hours: 3.00†1

15 Credits

Fall 3rd Year

- IDE 30100 - Professional Preparation In Interdisciplinary Engineering
- General Education Class 1 (Foundational Outcome H) - Credit Hours: 3.00
- Engineering Class 20000+ Level Elective - Credit Hours: 3.00 †2
- Area Elective 5 - Credit Hours: 3.00 †1
- Area Elective 6 - Credit Hours: 3.00 †1
- Area Elective 7 - Credit Hours: 2.00 †1

15 Credits

Spring 3rd Year

- IDE 36000 - Multidisciplinary Engineering Statistics †2
- Engineering Class 30000+ Level Elective - Credit Hours: 3.00 †2
- General Education 2 (Foundational Outcome BSS) - Credit Hours: 3.00
- General Education 3 (Foundational Outcome STS) - Credit Hours: 3.00
- Area Elective 8 - Credit Hours: 3.00 †1

15 Credits

Fall 4th Year

- IE 34300 - Engineering Economics Economics Elective †
- Engineering Design 30000+ - Credit Hours: 3.00†5
- General Education 4 (30000 level or non-intro) - Credit Hours: 3.00 †3
- General Education 5 - Credit Hours: 2.00 †3
- Area Elective 9 - Credit Hours: 3.00 †1

14 Credits

Spring 4th Year

- Engineering Class 30000+ Level Elective - Credit Hours: 3.00 †2
- Engineering Class 30000+ Level Elective - Credit Hours: 3.00 †2
- General Education 6 (30000 level or non-intro) - Credit Hours: 3.00 †3
- Area Elective 10 - Credit Hours: 3.00 †1
- MBSE Elective - Credit Hours: 3.00

15 Credits

Notes

*Satisfies a University Core Requirement

**Satisfies a Non-departmental Major Course Requirement.

†Multiple options are available - the most common is listed. †1 statics options, †2 thermodynamics options †3 area electives are chosen with aid of adviser to advance the student's educational objectives †4 dynamics options †5 engineering selectives are chosen with aid of adviser to advance the student's educational objectives †6 fluids option †7 materials options †8 statistics options †9 design selective †10 Capstone design selective.

†Multiple options are available: common option listed. †1 Area electives are chosen with aid of advisor to advance the student's educational objectives. Area classes for this plan of study are used to complete the requirements to take the MCATS and attend medical school. Courses to be completed include but are not limited to: 2 semesters General Biology with labs (minimum - should take more); 2 semesters General Chemistry with labs; 2 semesters Organic Chemistry with labs; 2 semesters Physics with labs; 2 semesters English Composition; 1 semester Biochemistry (no lab required; (* IU MD and Marian DO programs will require as of fall 2015); Anatomy and Physiology (not required but highly recommended for MCAT); 1 semester General Psychology (*IU MD and Marian DO programs will require as of fall 2015); 1 semester sociology (* IU MD and Marian DO programs will require as of fall 2015); other recommended courses Statistics. Generally, a grade below a C is not acceptable for a prerequisite course.

†2 engineering electives are chosen with aid of advisor to advance the student's educational objectives. †3 General Education courses can be taken from CLA, Krannert or Honors - consult advisor. †4 statistics selective could be approved equivalent (IE 23000/33000 /ECE 30200 /CHE 32000 /STAT 35000 /STAT 51100 - (if non engineering statistics selective chosen fulfills MBSE, but would require another 3 credit engineering course to be taken); †5 design selective - consult advisor for course selection. Engineering courses (30 credits of 20000+ level engineering courses, of which at least 15 credits are 30000+; MAX credits allowed in any one engineering discipline is 24.)

Graduation Index of 2.0 or higher and a min. GPA of 2.0 in Engineering courses at 20000+ level included in the POS. All other Purdue University graduation requirements including "There must be 32 credits of 30000+ level for graduation" must be satisfied.

*THE PLAN OF STUDY FROM 3RD SEMESTER ONWARDS SHOULD BE FILLED BY STUDENT AFTER CONSULTATION WITH ACADEMIC ADVISER. IDES/MDE web pages and Advisor are knowledge sources for specific requirements and completion

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

Multidisciplinary Engineering, BSE

About the Program

Multidisciplinary engineering is for students who plan to practice engineering as a career but whose specific career goals cannot be accommodated within one of the traditional engineering fields. The program offers considerable flexibility and permits you to choose from an established plan of study, or develop an individual plan of study to meet educational goals that can require bringing together multiple engineering disciplines, or non-engineering disciplines, at an advanced level to solve societal challenges. Established plans of study in the program include acoustical engineering, engineering management, visual design engineering, and general engineering, to name a few.

Link to https://engineering.purdue.edu/ENE/Academics/Undergrad

Degree Requirements

120 Credits Required

Multidisciplinary Engineering Major Courses

(45 credits of 20000+ level engineering courses, of which at least 18 credits are 30000+, and 6 credits 40000+; MAX credits allowed in any one engineering discipline is 24)

MUST TOTAL 45 CREDITS OF ENGINEERING COURSEWORK

Required Engineering Core (18-26 credits)

- ECE 20100 - Linear Circuit Analysis I or Equivalent - Credit Hours: 3.00

- ME 27000 - Basic Mechanics I *
  and
- ME 27400 - Basic Mechanics II *
  or
- AAE 20300 - Aeromechanics I *
  or
- CE 29700 - Basic Mechanics I (Statics) *
  and
- CE 29800 - Basic Mechanics II Dynamics *

- ME 30900 - Fluid Mechanics
  or
- CE 34000 - Hydraulics
  or
- AAE 33300 - Fluid Mechanics
  or
- CHE 37700 - Momentum Transfer
- or Equivalent - Credit Hours: 3.00

- ME 20000 - Thermodynamics I
  or
- ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems
  or
- CHE 21100 - Introductory Chemical Engineering Thermodynamics or Equivalent - Credit Hours: 3.00

- IE 34300 - Engineering Economics
  or
- IDE 48300 - Multidisciplinary Engineering Analysis & Decision Making or Equivalent - Credit Hours: 1.00 - 3.00

- EPCS 41100 - Senior Design Participation In EPICS
  and
- EPCS 41200 - Senior Design Participation In EPICS
  or
- IDE 48400 - Multidisciplinary Engineering Design Methodology
  and
- IDE 48500 - Multidisciplinary Engineering Design Project or Equivalent - Credit Hours: 3.00 - 4.00 (Must be taken at Purdue West Lafayette)

- IDE 30100 - Professional Preparation In Interdisciplinary Engineering (Must be taken at Purdue West Lafayette)
- IDE 48700 - Multidisciplinary Engineering Senior Professional Development (Must be taken at Purdue West Lafayette)

Engineering Selectives (8 credits)

Engineering Design (3 credits)

(Must be approved by Department of Engineering Education)

Examples:

- ABE 33000 - Design Of Machine Components
- AAE 25100 - Introduction To Aerospace Design
- CE 45600 - Wastewater Treatment Processes
- IE 38600 - Work Analysis And Design I

Hands-on (not computer) Lab (2 credits)

Examples:

- AAE 20401 - Aeromechanics II Laboratory
- AAE 33301 - Fluid Mechanics Laboratory
- ECE 20700 - Electronic Measurement Techniques
- CE 34300 - Elementary Hydraulics Laboratory
- ME 30900 - Fluid Mechanics

Engineering Courses in materials/strength of materials (3 credits)

Examples:

- MSE 23000 - Structure And Properties Of Materials
- NUCL 27300 - Mechanics Of Materials
- CE 23100 - Engineering Materials I

Engineering AREA Selective/Elective Courses (21 or 20 credits)

One of these beginning courses (3-4 credits)

Examples:

- ABE 21000 - Thermodynamics Principles Of Engineering And Biological Systems
- BME 20100 - Biomolecules: Structure, Function, And Engineering Applications
- CE 20300 - Principles And Practice Of Geomatics
- NUCL 20000 - Introduction to Nuclear Engineering

A follow up to core courses (3 credits)

Examples:

- ABE 43500 - Hydraulic Control Systems For Mobile Equipment
- AAE 33400 - Aerodynamics
- AAE 37200 - Jet Propulsion Power Plants
- BME 30400 - Biomedical Transport Fundamentals
- CE 27000 - Introductory Structural Mechanics

One additional advanced (30000+) course (3 credits)

Examples:

- ABE 30100 - Numerical And Computational Modeling In Biological Engineering
- ABE 30500 - Physical Properties Of Biological Materials
- ABE 32000 - Solid Modeling, Simulation, And Analysis
- ABE 32500 - Soil And Water Resource Engineering
- CE 30300 - Engineering Surveying

Engineering Elective courses to meet students educational objectives (3-10 credits)

Engineering courses only.

Other Departmental/Program Course Requirements (47-54 credits)

* (can be substituted with approved alternative FYE courses: i.e. ENGR 141/142, etc.)

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement & Quantitative Reasoning for core)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement & Quantitative Reasoning for core)

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

- CHM 11500 - General Chemistry (satisfies FYE requirement & Science Selective for core)
- ENGR 13100 - Transforming Ideas To Innovation I * (satisfies FYE requirement)
- ENGR 13200 - Transforming Ideas To Innovation II * (satisfies FYE requirement)
- COM 11400 - Fundamentals Of Speech Communication (satisfies General Education requirement & Oral Communication for core)
- PHYS 17200 - Modern Mechanics (satisfies FYE requirement & Science Selective for core)

- CS 15900 - Programming Applications For Engineers (satisfies FYE requirement)
  or
- CHM 11600 - General Chemistry (satisfies FYE requirement)

- MA 26200 - Linear Algebra And Differential Equations (satisfies Math requirement)
  or
- MA 26500 - Linear Algebra (satisfies Math requirement)
  and
- MA 26600 - Ordinary Differential Equations (satisfies Math requirement)

- MA 26100 - Multivariate Calculus (satisfies Math requirement)
- ENGL 10600 - First-Year Composition (satisfies FYE requirement, & general education, & Written Communication, & Information Literacy for core)

Choose One (Sophomore Science Selective)

- PHYS 24100 - Electricity And Optics
- PHYS 27200 - Electric And Magnetic Interactions
- BIOL 11000 - Fundamentals Of Biology I
- BIOL 23000 - Biology Of The Living Cell

Statistics Selective (3 credits)

Counts as either engineering or basic science & math

- IE 23000 - Probability And Statistics In Engineering I

- IE 33000 - Probability And Statistics In Engineering II
- IDE 36000 - Multidisciplinary Engineering Statistics
- ECE 30200 - Probabilistic Methods In Electrical And Computer Engineering
- CHE 32000 - Statistical Modeling And Quality Enhancement
- STAT 35000 - Introduction To Statistics
- STAT 51100 - Statistical Methods

Hands-on (not computer) Lab (1 credit)

1 credit from CHM 11600, THTR Sound Studio, AD, Engineering Lab, etc.

Area Electives (1-12 credits)

Chosen to satisfy student's educational objectives

Required area course(s) for General Engineering:

- CGT 11000 - Technical Graphics Communications
  or
- CGT 16300 - Graphical Communication And Spatial Analysis
  or
- CGT 16400 - Graphics For Civil Engineering And Construction

General Education (24 credits)

- GE 1 - Credit Hours: 3.00
- GE 2 - Credit Hours: 3.00
- GE 3 - Credit Hours: 3.00
- GE 4 - Credit Hours: 3.00
- GE 5 - Credit Hours: 3.00
- GE 6 - Credit Hours: 3.00
- ENGL 10600 - First-Year Composition
- COM 11400 - Fundamentals Of Speech Communication

University Core Requirements

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

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

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGL 10600 - First-Year Composition
- ENGR 13100 - Transforming Ideas To Innovation I

14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics
- ENGR 13200 - Transforming Ideas To Innovation II
- COM 11400 - Fundamentals Of Speech Communication

- CS 15900 - Programming Applications For Engineers
  or
- CHM 11600 - General Chemistry

16-17 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus
- ME 27000 - Basic Mechanics I +1
- ME 20000 - Thermodynamics I +2
- PHYS 24100 - Electricity And Optics or Science Selective - Credit Hours: 3.00 +
- Area Elective - Credit Hours: 3.00 +3

16 Credits

Spring 2nd Year

- MA 26200 - Linear Algebra And Differential Equations
- ME 27400 - Basic Mechanics II +4
- ECE 20100 - Linear Circuit Analysis I
- ECE 20700 - Electronic Measurement Techniques
- CGT 16300 - Graphical Communication And Spatial Analysis
- Area Elective - Credit Hours: 2.00 +3

15 Credits

Fall 3rd Year

- Engineering Class (Intro) - Credit Hours: 3.00 +5
- CE 34000 - Hydraulics +6
- CE 34300 - Elementary Hydraulics Laboratory
- MSE 23000 - Structure And Properties Of Materials +7
- IDE 30100 - Professional Preparation In Interdisciplinary Engineering
- General Education 1 (Core outcome H) - Credit Hours: 3.00

14 Credits

Spring 3rd Year

- IDE 36000 - Multidisciplinary Engineering Statistics +8
- Engineering Class (follow-up) - Credit Hours: 1.00 +5
- Engineering Class (follow-up) - Credit Hours: 2.00 +9
- General Education 4 (30000 level or non-intro) - Credit Hours: 3.00
- General Education 2 (Core Outcome BSS) - Credit Hours: 3.00
- Area Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

- IDE 48300 - Multidisciplinary Engineering Analysis & Decision Making
- IDE 48400 - Multidisciplinary Engineering Design Methodology
- IDE 48700 - Multidisciplinary Engineering Senior Professional Development
- Engineering Class 40000+ level (advanced) - Credit Hours: 3.00 +5

- General Education 3 (Core Outcome STS) - Credit Hours: 3.00
- General Education 5 - Credit Hours: 3.00
- Area Elective - Credit Hours: 3.00

15 Credits

Spring 4th Year

- IDE 48500 - Multidisciplinary Engineering Design Project +10
- AREA MBS or other - Credit Hours: 3.00
- Area Elective - Credit Hours: 3.00
- Engineering Class 30000+ level: Credit Hours: 3.00
- General Education 6 (30000+ level or non-intro) - Credit Hours: 3.00

15 Credits

Notes

** Satsifies a non-departmental Major Course Requirement.

+Multiple Options are available - the most common is listed.

+1 statics options

+2 thermodynamics options

+3 area electives are chosen with aid of advisor to advance the student's educational objectives

+4 dynamics options

+5 engineering selectives are chosen with aid of advisor to advance the student's educational objectives

+6 fluids option

+7 materials options

+8 statistics options

+9 design selective

+10 Capstone design selective

2.0 Graduation GPA required for Bachelor of Science in Engineering Degree.

THE PLAN OF STUDY FROM THIRD SEMESTER ONWARDS SHOULD BE FILLED BY STUDENT IN CONSULTATION WITH ACADEMIC ADVISOR.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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Minor

Engineering Leadership Minor

16 Credits Required

The Engineering Leadership Minor offers undergraduate engineering students opportunities to engage in experiential leadership experiences, faculty coaching, and technical leadership across a variety of contexts. This is available to students in the College of Engineering.

Requirements for the Minor

Required Core Courses (4 credits)

- ENGR 29600 - Experimental Courses
- ENGR 39700 - Global Engineering Experience

Elective Courses (12 credits)

Choose from at least 3 areas:

- Leadership, Communication, and Organizational Behavior
- Innovation, Design, and Problem Solving
- Global and/or Societal Awareness
- Research Methods
- Entrepreneurship and Management

Approved Course List

View the Approved Courses for Purdue College of Engineering's Engineering Leadership Minor here.

Notes

A grade of "C" or higher is mandatory for courses counting towards minor. A grade of "C-" in any of the minor courses is not adequate to fulfill the minor.

Minor courses must be taken at the Purdue West Lafayette campus. The only exceptions are as follows:

1. One equivalent transfer course from another university can be used if it is deemed acceptable by the department offering the course.

2. One equivalent Purdue substitution may be used if it is deemed equivalent to an approved minor course.

(No more than one substitution from either of the above two categories is acceptable.)

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Division of Environmental and Ecological Engineering

About Environmental and Ecological Engineering

Environmental and Ecological engineers use the principles of systems engineering, biology, and chemistry to develop strategies to protect human and environmental health, and design sustainable systems and technologies. Our unique name, Environmental and Ecological Engineering, was chosen to highlight our approach to managing complex problems with an integrated perspective that considers both environmental issues and ecological interactions. In the undergraduate curriculum there is an early focus on systems thinking and systems understanding with the inclusion of significant course requirements in ecology, sustainability, and industrial ecology. The EEE program strives for resilient design thinking that takes into account complexity and connectivity between systems.

Employment opportunities for EEE graduates are excellent. Most businesses, industries, all levels of government and many international organizations hire environmental and ecological engineers. Graduates are prepared to enter a wide-range of employment sectors in environmental and engineering fields including the industrial and construction, government, consulting, municipal and public service, non-governmental organizations (NGOs) and education sectors. Common career pathways center around:

Water and Watershed Stewardship: Ensuring that engineered systems and ecological systems interact sustainably.

Pollution Control, Monitoring, Abatement and Remediation: Wastewater, soil and air treatment/control, industrial waste control and recycling.

Industrial Ecology: Optimize industrial resource use; analyze and control of complete life-cycles of materials; industrial system redesign; energy efficiency optimization.

Sustainability: Provide for current needs without sacrificing future ability to meet needs. Consider the whole system, including complex interactions of environmental, technological and societal systems.

The U.S. Dept. of Labor projects substantial growth in jobs for the foreseeable future. Starting salaries are comparable to other Engineering fields and opportunities for advancement to positions of responsibility are excellent. Among the 14 **"Grand Challenges of Engineering"** announced by the National Academy of Engineering six of the 14 are explicitly in the domain of Environmental and Ecological engineering. Environmental engineering has a clear impact on societies and quality of life.

Students interested in engineering that can make a positive difference for people should consider Environmental and Ecological Engineering. Meet with an advisor or faculty member to craft an individualized plan of study to meet your career goals.

Research within Environmental and Ecological Engineering may be characterized as being multidisciplinary and focused on cutting edge issues. The EEE discovery mission is positioned to respond to society's need to understand the world we live in, and to develop strategies for sustainably managing Earth's limited resources and ecosystems so that they will be available for generations to come. Topics emphasized within the EEE research portfolio include: environmental fate of air, water, and soil contaminants; sustainable urban design; renewable energy and the water-energy nexus; water and wastewater treatment; sustainable industrial systems; water, air, and nutrient cycling; sustainability engineering education; bio-based materials and products; industrial ecology and industrial processes; air quality.

Mission Statement

The Division of Environmental and Ecological Engineering (EEE) furthers the learning, discovery, and engagement missions of the Purdue College of Engineering with a focus on understanding the ways in which all engineering activities affect and are affected by the environment. EEE will help the College fulfill the responsibility of service to the state, the nation, and the world through innovative and comprehensive undergraduate and graduate education, collaborative and wide-reaching research and discovery, and the assumption of ever-greater levels of leadership in addressing global environmental and ecological problems.

Faculty

https://engineering.purdue.edu/EEE/People

Contact Information

Division of Environmental & Ecological Engineering
Purdue University
Potter Engineering Center, Room 364
500 Central Drive
West Lafayette, IN 47907-2022
Phone: (765) 496-9697

Fax: (754) 494-4482
Email: eee@purdue.edu

Baccalaureate

Environmental and Ecological Engineering, BSEEE

About the Program

Environmental and Ecological engineers use the principles of systems engineering, biology, and chemistry to develop strategies to protect human and environmental health, and design sustainable systems and technologies. Our unique name, Environmental and Ecological Engineering, was chosen to highlight our approach to managing complex problems with an integrated perspective that considers both environmental issues and ecological interactions. In the undergraduate curriculum there is an early focus on systems thinking and systems understanding with the inclusion of significant course requirements in ecology,

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Water and Watershed Stewardship: Ensuring that engineered systems and ecological systems interact sustainably.

Pollution Control, Monitoring, Abatement and Remediation: Wastewater, soil and air treatment/control, industrial waste control and recycling.

Industrial Ecology: Optimize industrial resource use; analyze and control of complete life-cycles of materials; industrial system redesign; energy efficiency optimization.

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Program Educational Objectives

Graduates of the EEE Undergraduate Program will:

• Be prepared to assume immediate employment in the fields of environmental and ecological engineering or to continue education in an advanced degree program;

• Participate fully and ethically in the advancement of the profession within five years of graduation, as measured by one or more of the following:

- Achievement of, or significant progress toward, professional licensure
- Achievement of, or significant progress toward, an advanced degree
- Publication of research results and/or field reports

- Advancement to leadership roles within an engineering organization
- Professional participation in international engineering activities
- Participation with organizations, agencies, or companies who offer solutions to major societal and environmental issues.

Program Outcomes

Upon graduation, graduates of EEE will show:

- An ability to apply knowledge of mathematics, science and engineering,
- An ability to design and conduct experiments, as well as to analyze and interpret data,
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to function on multidisciplinary team
- An ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- An ability to communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- A knowledge of the roles and responsibilities of public institutions and private organizations pertaining to environmental and ecological engineering
- A knowledge of sustainability tools used in all engineering thought, and an ability to use these tools in the design process

Degree Requirements

128 Credits Required

Departmental/Program Major Courses (46 credits)

Required Major Courses (23 credits)

- EEE 25000 - Environmental, Ecological, and Engineering Systems
- EEE 29000 - Introduction to Environmental And Ecological Engineering Seminar
- EEE 30000 - Environmental And Ecological Systems Modeling

- CE 35000 - Introduction To Environmental And Ecological Engineering
  or
- EEE 35000 - Introduction To Environmental And Ecological Engineering

- CE 35500 - Engineering Environmental Sustainability
  or
- EEE 35500 - Engineering Environmental Sustainability

- EEE 36000 - Environmental And Ecological Engineering Laboratory
- EEE 39000 - Environmental And Ecological Engineering Professional Practice Seminar
- EEE 43000 - Industrial Ecology And Life Cycle Analysis
- EEE 48000 - Environmental And Ecological Engineering Senior Design - Fall Credit Hours: 1.00
- EEE 48000 - Environmental And Ecological Engineering Senior Design - Spring Credit Hours: 2.00

Major Selectives (18 credits) & Technical Electives (5 credits)

- EEE Selective 1 - Category A - Credit Hours: 3.00
- EEE Selective 2 - Category B - Credit Hours: 3.00
- EEE Selective 3 - Category C - Credit Hours: 3.00
- EEE Selective 4 - Credit Hours: 3.00
- EEE Selective 5 - Credit Hours: 3.00
- EEE Selective 6 - Credit Hours: 3.00
- Technical Elective 1 - Credit Hours: 2.00
- Technical Elective 2 - Credit Hours: 3.00

Other Departmental/Program Course Requirements (55 credits)

*satisfies First Year Engineering requirement

- ENGR 13100 - Transforming Ideas To Innovation I *
- ENGR 13200 - Transforming Ideas To Innovation II *
- MA 16500 - Analytic Geometry And Calculus I *
- MA 16600 - Analytic Geometry And Calculus II *
- CHM 11500 - General Chemistry *
- CHM 11600 - General Chemistry *
- PHYS 17200 - Modern Mechanics *
- MA 26100 - Multivariate Calculus
- MA 26200 - Linear Algebra And Differential Equations

- CE 29700 - Basic Mechanics I (Statics)
  or
- ME 27000 - Basic Mechanics I

- CE 29800 - Basic Mechanics II Dynamics
  or
- ME 27400 - Basic Mechanics II

- CE 34000 - Hydraulics
  and
- CE 34300 - Elementary Hydraulics Laboratory

- ME 20000 - Thermodynamics I

Choose Statistics course:

- STAT 35000 - Introduction To Statistics

or

- IE 23000 - Probability And Statistics In Engineering I
  or
- IE 33000 - Probability And Statistics In Engineering II

- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- BIOL 28600 - Introduction To Ecology And Evolution

Choose Advanced Ecology course:

- BIOL 48300 - Great Issues: Environmental And Conservation Biology
  or
- BIOL 58500 - Ecology

EEE General Education Electives (24 credits) and Free Elective (2 - 3 credits)

General Education Electives can be used to satisfy University Core Requirements. This is noted below. Therefore, students should also reference the University Core Requirements section below.

- Satisy (H) - Credit Hours: 3.00
- Satisfy (BSS) - Credit Hours: 3.00
- *Satisfy (WC) - CreditHours: 3.00 - 4.00
- *Satisfy (OC) - Credit Hours: 3.00
- EEE intersection of Society/Environment - Credit Hours: 3.00
- Additional 3 Credit Hours
- Additional 3 Credit Hours
- Additional 3 Credit Hours
- Free Elective - Credit Hours: 2.00 - 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Degree Requirements

Select EEE General Education Program Requirements and EEE Selective Course Lists for additional lists.

Program Requirements

Fall 1st Year

- ENGR 13100 - Transforming Ideas To Innovation I ♦
- MA 16500 - Analytic Geometry And Calculus I ♦
- CHM 11500 - General Chemistry ♦
- Free Elective - Credit Hours: 1.00 - 2.00
- University Core (Written Communication) - Credit Hours: 3.00 - 4.00

15 Credits

Spring 1st Year

- ENGR 13200 - Transforming Ideas To Innovation II ♦
- MA 16600 - Analytic Geometry And Calculus II ♦
- CHM 11600 - General Chemistry ♦
- PHYS 17200 - Modern Mechanics ♦
- University Core (Oral Communication) - Credit Hours: 3.00

17 Credits

Fall 2nd Year

- EEE 25000 - Environmental, Ecological, and Engineering Systems
- EEE 29000 - Introduction to Environmental And Ecological Engineering Seminar
- EEE 35500 - Engineering Environmental Sustainability
- BIOL 12100 - Biology I: Diversity, Ecology, And Behavior
- MA 26100 - Multivariate Calculus ♦
- General Education Elective - Credit Hours: 3.00

16 Credits

Spring 2nd Year

- EEE 35000 - Introduction To Environmental And Ecological Engineering ♦
- MA 26200 - Linear Algebra And Differential Equations
- ME 20000 - Thermodynamics I
- General Education Elective - Credit Hours: 3.00

- CE 29700 - Basic Mechanics I (Statics)
  or
- ME 27000 - Basic Mechanics I ♦

16 Credits

Fall 3rd Year

- EEE 36000 - Environmental And Ecological Engineering Laboratory ♦

- CE 29800 - Basic Mechanics II Dynamics
  or
- ME 27400 - Basic Mechanics II ♦

  Choose Statistics course:
- STAT 35000 - Introduction To Statistics
  or
- IE 23000 - Probability And Statistics In Engineering I
  or
- IE 33000 - Probability And Statistics In Engineering II

- Technical Elective 1 - Credit Hours: 2.00
- EEE Selective 1 - Category A - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00

17 Credits

Spring 3rd Year

- EEE 30000 - Environmental And Ecological Systems Modeling

- CE 34000 - Hydraulics
  and
- CE 34300 - Elementary Hydraulics Laboratory

- EEE 39000 - Environmental And Ecological Engineering Professional Practice Seminar
- EEE 43000 - Industrial Ecology And Life Cycle Analysis
- BIOL 28600 - Introduction To Ecology And Evolution
- EEE Selective 2 - Category B - Credit Hours: 3.00

16 Credits

Fall 4th Year

- EEE 48000 - Environmental And Ecological Engineering Senior Design ♦

Choose Advanced Ecology course:

- BIOL 58500 - Ecology
  or
- BIOL 48300 - Great Issues: Environmental And Conservation Biology

- EEE Selective 3 - Category C - Credit Hours: 3.00
- EEE Selective 4 - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Technical Elective 2 - Credit Hours: 3.00

16 Credits

Spring 4th Year

- EEE 48000 - Environmental And Ecological Engineering Senior Design
- EEE Selective 5 - Credit Hours: 3.00
- EEE Selective 6 - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- General Education Elective - Credit Hours: 3.00
- Free Elective - Credit Hours: 1.00

15 Credits

Notes

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

2.0 Graduation GPA required for Bachelor of Science degree.

2.0 in College of Engineering courses at the 20000-level and above

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

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Minor

Environmental and Ecological Engineering Minor

17 - 18 Credits Required

EEE offers a minor in Environmental and Ecological Engineering, as a mechanism for students in all branches of engineering, and other related fields, to gain expertise and qualifications in EEE fields. The minor is most appropriate for students who have particular environmental interests in engineering, or who want to develop a career at the interface of EEE and their chosen major field. Environmental concerns touch all aspects of engineering, making this an attractive option for many students, and an attractive set of qualifications for many prospective employers.

The minor in EEE is available to any student at Purdue who has met the co- and/or pre-requisites for courses in the EEE course sequence.

Students interested in the EEE minor should contact the Associate Director of Advising with any questions or for advice about appropriate courses.

Requirements for the Minor

Required: Choose one of the following-

- EEE 35000 - Introduction To Environmental And Ecological Engineering

or

- CE 35000 - Introduction To Environmental And Ecological Engineering

or

- ABE 32500 - Soil And Water Resource Engineering

Required: Choose one of the following-

- CE 35500 - Engineering Environmental Sustainability

or

- EEE 35500 - Engineering Environmental Sustainability

Required: Choose one of the following-

- EEE 43000 - Industrial Ecology And Life Cycle Analysis

or

- EEE 53000 - Life Cycle Assessment: Principles And Applications

Required: Choose one of the following-

- BIOL 28600 - Introduction To Ecology And Evolution

or

- FNR 59800 - Topical Problems In Forestry And Natural Resources (Course Title: Urban Ecology)
  Selectives List: Choose 2 courses (minimum 6 credits total) from the provided Selectives document.

Notes

Students successfully completing their sequence of courses, with at least a 2.0 grade point average for the sequence, will be granted a minor in Environmental and Ecological Engineering.

Depending on the course requirements for the student's major, several of these courses may also meet major requirements. Thus, students may need less than 6 additional courses beyond their major requirements to earn the EEE minor. For example, several engineering majors offer environment-related courses that are on the EEE Minor Selective List, and several majors allow the required courses for the EEE minor to count as technical or engineering electives for the major.

Students should note:

1. Many of the required courses have pre-requisites. Most (if not all) engineering students will meet the prerequisites for EEE/CE 35000, EEE/CE 35500, EEE 43000, and ME 59700. However, ABE 32500 requires AGRY 25500 (Soil Science), a course not typically taken by engineering majors except ABE students, and BIOL 28600 requires one or more of several introductory biology courses. The simplest pathway for engineering students who are not taking biology courses for other reasons is to take BIOL 12100, a two credit course offered every fall. BIOL 12100 alone is an accepted pre-requisite for BIOL 28600.
2. Students may propose additional courses to be added to the EEE Minor Selective List. The purpose of this requirement is to allow students to explore upper-level technical courses in their major that have an environmental theme, an environmental context, or an important environmental application. Many courses that may be appropriate, including special topics, experimental, study abroad, and independent study/research courses are added every semester, and EEE welcomes proposals from students to be able to count these courses for the EEE minor. Students should contact the Associate Director of Advising with questions, or if they have a course they would like to propose.

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School of Industrial Engineering

About Industrial Engineering

Industrial engineers design, analyze, and manage complex human-integrated systems such as manufacturing systems, supply chain networks, and service systems. These systems typically consist of a combination of people, information, material, and equipment. In such systems industrial engineers determine how to optimize the system for maximum efficiency, effectiveness, throughput, safety, or some other objective of interest to the stakeholders of the system. To achieve these objectives, an industrial engineer draws upon knowledge of mathematics, along with physical, engineering, management, and behavioral sciences to function as a problem-solver, innovator, designer, coordinator, and system integrator. Industrial engineers are employed in and apply their skills in an extremely wide range of organizations, including manufacturing industries, service industries, and governmental agencies.

The complexity of these organizations and the emphasis on increased effectiveness, efficiency, and productivity have led to a growing need for industrial engineering analysis and design, resulting in an increased demand for industrial engineering graduates. This increased demand recognizes the modern industrial engineer's versatility and responsiveness to the challenges of a rapidly changing society. Industrial engineering is one of the nation's largest and most rapidly growing engineering professions.

The industrial engineering program prepares graduates for careers in all phases of industrial engineering and enables them to perform both technical and managerial functions that require scientific and engineering backgrounds. By combining the study of science, mathematics, engineering fundamentals, design, and management principles, an industrial engineering education provides a unique background and a sound basis for lifelong career development in engineering practice, research, or management.

Senior design projects consist of a real-world application of IE principles by teaming students with a local industry in Indiana. Teams have taken on full-scale projects like designing floor layouts for factories and hospitals, designing operations to improve system efficiency, reducing time and waste in processing, allocating resources to optimize system performance, and developing a safety plan for preventing work-related injuries.

Faculty

https://engineering.purdue.edu/IE/People/Faculty

Contact Information

Main Office

School of Industrial Engineering
Purdue University
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Fax: +1 (765) 494-6802

Graduate Information

For Graduate Information please see Industrial Engineering Graduate Program Information.

Baccalaureate

Industrial Engineering, BSIE

About the Program

Industrial engineers design, analyze, and manage complex human-integrated systems such as manufacturing systems, supply chain networks, and service systems. These systems typically consist of a combination of people, information, material, and equipment. In such systems industrial engineers determine how to optimize the system for maximum efficiency, effectiveness, throughput, safety, or some other objective of interest to the stakeholders of the system. To achieve these objectives, an industrial engineer draws upon knowledge of mathematics, along with physical, engineering, management, and behavioral

sciences to function as a problem-solver, innovator, designer, coordinator, and system integrator. Industrial engineers are employed in and apply their skills in an extremely wide range of organizations, including manufacturing industries, service industries, and governmental agencies.

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Degree Requirements

123 Credits Required

Industrial Engineering Major Courses (36 credits)

Required IE Courses (36 credits)

- IE 20000 - Industrial Engineering Seminar
- IE 23000 - Probability And Statistics In Engineering I
- IE 33000 - Probability And Statistics In Engineering II
- IE 33200 - Computing In Industrial Engineering
- IE 33500 - Operations Research - Optimization
- IE 33600 - Operations Research - Stochastic Models
- IE 34300 - Engineering Economics
- IE 37000 - Manufacturing Processes I
- IE 38300 - Integrated Production Systems I
- IE 38600 - Work Analysis And Design I
- IE 43100 - Industrial Engineering Design
- IE 47400 - Industrial Control Systems
- IE 48600 - Work Analysis And Design II

IE Technical Electives (15 credits)

Basic requirements:

6 credits required in IE courses.
9 credits required from approved list of courses to bring total to 15 credits.

- IE 47000 - Manufacturing Processes II
  and
  Select one option to complete 6 cr. of IE courses.
  Option 1:
- IE 48400 - Integrated Production Systems II

  Option 2:
- IE 47000 - Manufacturing Processes II
  or
- IE 48400 - Integrated Production Systems II
  and
- IE 5XX00 - Credit Hours: 3.00

  Select 9 cr. of coursework from approved Technical Elective list (attached: technical elective program and approved technical elective courses).

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00

Other Departmental/Program Course Requirements (55-57 credits)

Mathematics Requirements (18 - 20 credits)

*Satisfies a University Core Requirement

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement) *
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement) *

- MA 16600 - Analytic Geometry And Calculus II (satisfies FYE requirement) *
  or
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies FYE requirement) *

- MA 26100 - Multivariate Calculus *
- MA 26500 - Linear Algebra *
- MA 26600 - Ordinary Differential Equations *

Science Requirements (14 credits)

- PHYS 17200 - Modern Mechanics (satisfies FYE requirement)*
- PHYS 24100 - Electricity And Optics *
- CHM 11500 - General Chemistry (satisfies FYE requirement) *
- CS 15900 - Programming Applications For Engineers (satisfies FYE requirement)

General Engineering/Engineering Science Requirements (16 credits)

- ENGR 13100 - Transforming Ideas To Innovation I (satisfies FYE requirement)*
- ENGR 13200 - Transforming Ideas To Innovation II (satisfies FYE requirement)
- ME 27000 - Basic Mechanics I
- ME 20000 - Thermodynamics I
- NUCL 27300 - Mechanics Of Materials
- ECE 20100 - Linear Circuit Analysis I

General Education Elective Requirements (24 credits)

Foundational Core

(http://www.purdue.edu/provost/initiatives/curriculum/course.html)

- (satisfies Information Literacy selective for core; ENGL 10600/ENGL 10800 strongly recommended) - Credit Hours: 3.00
- (satisfies Written Communication selective for core; ENGL 10600/ENGL 10800 strongly recommended) - Credit Hours: 3.00
- (satisfies Oral Communication selective for core; COM 11400 strongly recommended) - Credit Hours: 3.00
- (satisfies Human Cultures: Humanities selective for core) - Credit Hours: 3.00
- (satisfies Human Cultures: Behavioral/Social Science selective for core) - Credit Hours: 3.00
- (satisfies Science, Technology, and Society selective for core) - Credit Hours: 3.00

IE General Education Electives

See general education program document (attached: general education electives program) to identify additional requirements.

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Requirements

Select Industrial Engineering BSIE Approved-TE-Courses_F16.pdf, Industrial Engineering BSIE General-Eduation-Elective-Program_F16.pdf, and Industrial Engineering BSIE Technical-Elective-Program_F16.pdf for additional lists.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGR 13100 - Transforming Ideas To Innovation I
- General Education Elective I - Credit Hours: 3.00 - 4.00 (Written Comm selective for core; ENGL 10600/ENGL 10800 strongly recommended)

13-14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- CS 15900 - Programming Applications For Engineers
- PHYS 17200 - Modern Mechanics
- ENGR 13200 - Transforming Ideas To Innovation II
- General Education Elective II - Credit Hours: 3.00 (Oral Comm selective for core; COM 11400 strongly recommended)

16 Credits

Fall 2nd Year

- MA 26100 - Multivariate Calculus
- ME 27000 - Basic Mechanics I
- IE 20000 - Industrial Engineering Seminar
- IE 23000 - Probability And Statistics In Engineering I
- IE 34300 - Engineering Economics
- General Elective III - Credit Hours: 3.00

16 Credits

Spring 2nd Year

- MA 26500 - Linear Algebra
- NUCL 27300 - Mechanics Of Materials
- PHYS 24100 - Electricity And Optics
- IE 33000 - Probability And Statistics In Engineering II
- General Elective IV - Credit Hours: 3.00 (Humanities selective for core recommended)

15 Credits

Fall 3rd Year

- MA 26600 - Ordinary Differential Equations
- ECE 20100 - Linear Circuit Analysis I
- IE 33200 - Computing In Industrial Engineering
- IE 33500 - Operations Research - Optimization
- IE 37000 - Manufacturing Processes I
- General Elective V - Credit Hours: 3.00 (Human Cultures: Behavioral/Social Science selective for core recommended)

18 Credits

Spring 3rd Year

- IE 33600 - Operations Research - Stochastic Models
- ME 20000 - Thermodynamics I
- IE 38300 - Integrated Production Systems I
- IE 38600 - Work Analysis And Design I
- General Elective VI - Credit Hours: 3.00 (Science, Technology, and Society selective for core recommended)

15 Credits

Fall 4th Year

- IE 47400 - Industrial Control Systems
- IE 48600 - Work Analysis And Design II
- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- General Elective VII - Credit Hours: 3.00

15 Credits

Spring 4th Year

- IE 43100 - Industrial Engineering Design
- IE Technical Elective I - Credit Hours: 3.00
- IE Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- General Elective VIII - Credit Hours: 3.00

15 Credits

Notes

*Satisfies a University Core Requirement

2.0 Graduation GPA required for Bachelor of Engineering degree.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

School of Materials Engineering

An Overview

Materials Engineering

Materials have enabled improvement in the products humans use since the beginning of recorded history. For example without the development of high purity silicon most of today's electronic devices would not exist. New low density, high stiffness composite materials have replaced metals and wood in tennis racquets. The performance of these materials stems from their properties which depend on their microscopic structure, also known as microstructure. Microstructure in turn depends upon

materials processing, the fabrication of materials into functional shapes. Materials Engineering is the study of the interrelationships between processing, structure, properties and performance of materials.

Materials engineers study the structure and composition of materials on scales ranging from the electronic and atomic through the microscopic to the macroscopic. They develop new materials, improve traditional materials and are key people in the manufacturing process to produce materials reliably and economically. They seek to understand phenomena and to measure materials properties of all kinds, and they predict and evaluate the performance of real materials as structural or functional elements in engineering systems. Employment opportunities span all types of industry, such as aerospace, automotive, chemical, electronic, energy and primary material-producing companies.

Faculty

https://engineering.purdue.edu/MSE/People/ptFaculty

Contact Information

School of Materials Engineering
Neil Armstrong Hall of Engineering
701 West Stadium Avenue
West Lafayette, IN 47907-2045
Telephone: (765) 494-4100
FAX: (765) 494-1204
E-mail regarding academic programs: vicline@purdue.edu

Graduate Information

For Graduate Information please see Materials Engineering Graduate Program Information.

Baccalaureate

Materials Engineering, BSMSE

About the Program

Materials Engineering's academic programs have been developed around broad and basic phenomena, applied to all major classes of artificial materials-ceramics, metals, glasses, polymers, and semiconductors. The undergraduate and graduate programs integrate our faculty strengths across the field's four cornerstones: structure, properties, processing, and performance.

The first three years of study provide the basic educational core. In addition to the broad range of basic sciences and general education courses, the core provides a generic approach to the elements of the field. The core exploits the idea that the field is composed of the key elements of the field: synthesis/processing, composition/structure, properties and performance. This concept provides the foundation across all the materials classes: ceramics, metals, polymers, etc. The senior year, consisting of primarily electives, allows students the opportunity to focus their program toward personal goals in the field.

Degree Requirements

126 Credits Required

Materials Engineering Major Courses (42 credits)

(https://engineering.purdue.edu/MSE/Academics/Undergrad/undergrad_manual.pdf)

Required MSE Courses (42 credits)

- MSE 23000 - Structure And Properties Of Materials
- MSE 23500 - Materials Properties Laboratory
- MSE 25000 - Physical Properties In Engineering Systems
- MSE 26000 - Thermodynamics Of Materials
- MSE 27000 - Atomistic Materials Science
- MSE 33000 - Processing And Properties Of Materials
- MSE 33500 - Materials Characterization Laboratory
- MSE 34000 - Transport Phenomena
- MSE 36700 - Materials Processing Laboratory
- MSE 37000 - Electrical, Optical, And Magnetic Properties Of Materials
- MSE 38200 - Mechanical Response Of Materials
- MSE 39000 - Materials Engineering Seminar (taken each semester)
- MSE 43000 - Materials Processing And Design I
- MSE 44000 - Materials Processing And Design II
- MSE 44500 - Materials Engineering Systems Analysis And Design

MSE technical Electives - (18 credits)

(See the MSE undergraduate manual for an approved list.)

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- Technical Elective IV - Credit Hours: 3.00
- Technical Elective V or Support Area Elective I - Credit Hours: 3.00
- Technical Elective VI or Support Area Elective II - Credit Hours: 3.00

Other Departmental/Program Course Requirements (66 credits)

General Engineering Requirements (4 credits)

- ENGR 13100 - Transforming Ideas To Innovation I
  or

- ENGR 14100 - Honors Creativity And Innovation In Engineering Design I

- ENGR 13200 - Transforming Ideas To Innovation II
  or
- ENGR 14200 - Honors Creativity And Innovation In Engineering Design II

Mathematics Requirements (18 credits)

Alternative sequence to MA 26500/26600 is MA 26200 followed by either MA 30300 or MA 35100.

- MA 16500 - Analytic Geometry And Calculus I (Satisfies Quantitative Reasoning Selective for core)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (Satisfies Quantitative Reasoning Selective for core)

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

- MA 26100 - Multivariate Calculus
- MA 26500 - Linear Algebra
- MA 26600 - Ordinary Differential Equations

Science Requirements (20 credits)

PHYS 25200 may be replaced by another 1-credit hour science laboratory as listed in the MSE undergraduate manual

PHYS 27200 replaces both PHYS 24100 and PHYS 25200

- CHM 11500 - General Chemistry (satisfies Science Selective for core)
  or
- CHM 13600 (satisfies Science Selective for core)

- CHM 11600 - General Chemistry
  or
- CHM 13600 - General Chemistry Honors

- CHM 25700 - Organic Chemistry
- PHYS 17200 - Modern Mechanics (satisfies Science Selective for core)

- PHYS 24100 - Electricity And Optics
  or
- PHYS 27200 - Electric And Magnetic Interactions

- PHYS 25200 - Electricity And Optics Laboratory

MSE General Education Requirement (24 credits)

- ENGL 10600 - First-Year Composition or equivalent (satisfies Written Communication and Information Literacy Selectives)
- COM 11400 - Fundamentals Of Speech Communication (satisfies Oral Communication for core)
  Foundation Core
- G.E. I (satisfies Human Cultures Humanities for core) - Credit Hours: 3.00
- G.E. II (satisfies Human Cultures Behavioral/Social Science for core) - Credit Hours: 3.00
- G.E. III (satisfies Science, Technology & Society for core) - Credit Hours: 3.00
  MSE General Education Electives (see the MSE undergraduate manual for an approved list)
- G.E. IV - Credit Hours: 3.00
- G.E. V - Credit Hours: 3.00
- G.E. VI - Credit Hours: 3.00

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Program Requirements

Fall 1st Year

- MA 16500 - Analytic Geometry And Calculus I
- CHM 11500 - General Chemistry
- ENGL 10600 - First-Year Composition (or equivalent)
- ENGR 13100 - Transforming Ideas To Innovation I

13-14 Credits

Spring 1st Year

- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics
- CHM 11600 - General Chemistry
- ENGR 13200 - Transforming Ideas To Innovation II
- COM 11400 - Fundamentals Of Speech Communication

17 Credits

Fall 2nd Year

- MSE 23000 - Structure And Properties Of Materials
- MSE 23500 - Materials Properties Laboratory
- MA 26100 - Multivariate Calculus
- PHYS 24100 - Electricity And Optics
- MA 26500 - Linear Algebra
- MSE 39000 - Materials Engineering Seminar

16 Credits

Spring 2nd Year

- MSE 25000 - Physical Properties In Engineering Systems
- MSE 26000 - Thermodynamics Of Materials
- MSE 27000 - Atomistic Materials Science
- MA 26600 - Ordinary Differential Equations
- General Elective I - Credit Hours: 3.00
- PHYS 25200 - Electricity And Optics Laboratory
- MSE 39000 - Materials Engineering Seminar

16 Credits

Fall 3rd Year

- MSE 33500 - Materials Characterization Laboratory
- MSE 34000 - Transport Phenomena
- MSE 37000 - Electrical, Optical, And Magnetic Properties Of Materials
- CHM 25700 - Organic Chemistry
- General Elective II - Credit Hours: 3.00
- MSE 39000 - Materials Engineering Seminar

16 Credits

Spring 3rd Year

- MSE 33000 - Processing And Properties Of Materials
- MSE 36700 - Materials Processing Laboratory
- MSE 38200 - Mechanical Response Of Materials
- Technical Elective I - Credit Hours: 3.00
- General Elective III - Credit Hours: 3.00
- MSE 39000 - Materials Engineering Seminar

15 Credits

Fall 4th Year

- MSE 43000 - Materials Processing And Design I
- MSE 44500 - Materials Engineering Systems Analysis And Design
- MSE 39000 - Materials Engineering Seminar
- General Elective IV - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00

15 Credits

Spring 4th Year

- MSE 44000 - Materials Processing And Design II
- Technical Elective IV - Credit Hours: 3.00
- Technical Elective V - Credit Hours: 3.00
- Technical Elective VI - Credit Hours: 3.00
- General Elective V - Credit Hours: 3.00
- General Elective VI - Credit Hours: 3.00

18 Credits

Note

Students must have a graduation index of 2.0 and must have a minimum average GPA of 2.0 in MSE 20000 and 30000 level courses.

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

Disclaimer

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

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

Minor

Materials Science and Engineering Minor

A minor in Materials Engineering is available to students with an entering cumulative GPA of 3.2 or better. A MSE Minor will be granted on the completion of the following 18 hrs.

The core requirements are

- MSE 23000 - Structure And Properties Of Materials
- MSE 26000 - Thermodynamics Of Materials
- MSE 33000 - Processing And Properties Of Materials

And three of the following electives

- MSE 27000 - Atomistic Materials Science
- MSE 37000 - Electrical, Optical, And Magnetic Properties Of Materials
- MSE 34000 - Transport Phenomena
- MSE 38200 - Mechanical Response Of Materials
- MSE 5xx00 level courses (with Faculty Approval) - Credit Hours: 3.00

Notes

No laboratory classes can fulfill the MSE minor requirements. This includes MSE 23500, MSE 33500, MSE 36700, MSE 43000, MSE 44000, and MSE 49900.

Up to two MSE 5xx level courses can be taken to fulfill the 18 credit hours required.

If student is ME, NE, or ChE, then MSE 34000 is not allowed and the 9 credits must be selected from rest of elective list.

A grade of "C" (not "C-") or better in all of the courses taken toward the MSE minor is required.

Generally, all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus.

[1] NUCL 32000 and CE 23100 are also acceptable.

[2] Prerequisites for MSE 5xx00 courses will vary by course.

The pre- and co-requisites for MSE courses relevant to the minor are

Class	Pre- and Co-requisites
MSE 23000	Pre: CHM 11500, MA 16500
MSE 26000	Pre: CHM 11500, MA 16500; Co: MSE 23000
MSE 27000	Pre: MA 26100; Co: MSE 23000, MA 26500
MSE 33000	Pre: MSE 23000; MSE 26000
MSE 34000	Pre: MA 26600
MSE 37000	Pre: MSE 23000, MSE 27000, PHYS 24100
MSE 38200	Pre: MA 26500 and Statics/Dynamics Course
MSE 5xx00	Pre: MSE 23000 and Consent of Instructor[2]

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School of Mechanical Engineering

An Overview

Mechanical Engineering comprises a wide range of activities that include researching, designing, developing, manufacturing, managing and controlling engineering systems and their components. The many industrial sectors to which mechanical engineers make substantial contributions include:

- aerospace/defense,
- automotive,
- biotechnology/pharmaceutical,
- chemical/petroleum,

- computers/electronics,
- construction,
- consumer/food products,
- energy/nuclear,
- heavy/off-road equipment,
- engineering consulting,
- thermal systems,
- graduate education,among others.

Beyond these traditional roles, mechanical engineers are increasingly pursuing a number of non-traditional career paths including:

- business/financial services,
- dentistry,
- education,
- engineering and public policy,
- law (patent law and intellectual property), and
- medicine/healthcare (prosthetics, surgical robotics and instruments, human motion kinetics, etc.).

As such, mechanical engineering is the broadest of all of the engineering disciplines and provides the widest range of career opportunities. Graduates of the School of Mechanical Engineering have gone on to become CEOs, entrepreneurs, chief engineers, business analysts, astronauts, faculty, physicians, dentists, patent lawyers and public policy leaders, and entrepreneurs.

Faculty

Students interested in pursuing undergraduate research opportunities in the School of Mechanical Engineering are encouraged to contact faculty who conduct research in their chosen area of interest. A comprehensive list of Mechanical Engineering faculty along with a brief resume for each is provided at the link listed below.

https://engineering.purdue.edu/ME/People/index.html

Contact Information

Questions concerning any aspect of the School of Mechanical Engineering can be directed to any of the following offices.

Undergraduate Office

School of Mechanical Engineering
Purdue University
585 Purdue Mall
West Lafayette, IN 47907-2088
Phone: (765) 494-5689
Fax: (765) 494-0051

meugoff@ecn.purdue.edu

Graduate Office
megradoffice@purdue.edu and megradapps@purdue.edu

Development Office
mealumni@purdue.edu

Administration
mehead@ecn.purdue.edu

Graduate Information

For Graduate Information please see Mechanical Engineering Graduate Program Information .

Baccalaureate

Mechanical Engineering, BSME

About the Program

Program Educational Objectives and Outcomes
The School of Mechanical Engineering offers coursework leading to the Bachelor of Science in Mechanical Engineering (B.S.ME).
The program educational objectives of the School of Mechanical Engineering are to matriculate graduates who conduct themselves in a responsible, professional and ethical manner (citizenship), and who upon the years following graduation, are committed to:

1. Discovery

- Actively embracing leadership roles in the practice of engineering in industry and government organizations (including both traditional and emerging technical areas).
- Conducting research and development across disciplines (via graduate study or industry) to advance technology and foster innovation in order to compete successfully in the global economy.
- Applying their engineering problem-solving skills to less-traditional career paths (e.g., law, medicine, business, education, start-up ventures, public policy, etc.).

2. Learning

- Actively participating in ongoing professional development opportunities (conferences, workshops, short courses, graduate education, etc.).
- Updating and adapting their core knowledge and abilities to compete in the ever-changing global enterprise.
- Developing new knowledge and skills to pursue new career opportunities.

3. Engagement

- Serving as ambassadors for the engineering profession, inspiring others to develop a passion for engineering.
- Exchanging and applying knowledge to create new opportunities that advance society and solve a variety of technical and social problems.
- Advancing entrepreneurial ventures and fostering activities that support sustainable economic development to enhance the quality of life of people in the state, across the country and around the world.

In order for students to achieve these objectives. the program of study should satisfy the comprehensive set of program outcomes categorized in three areas: engineering foundational skills, professional skills, and emerging skills.

Engineering Foundational Skills

The program should provide students with a solid technical foundation for their careers. This foundation should include:

- Engineering fundamentals.
- Analytical skills.
- Experimental skills.
- Modern engineering tools.
- Design skills.
- Impact of engineering solutions.

Professional Skills

The program should prepare students to be effective engineers in the professional workplace. To this end, students should develop the following professional skills:

- Communication skills.
- Teamwork skills.
- Professional and ethical responsibility.
- Contemporary issues.
- Lifelong learning.

Emerging Skills

The program should assist students in fostering a number of other emerging skills that are becoming increasingly critical to the success of future engineers. These emerging skills include:

- Leadership.
- Global engineering skills.
- Innovation.
- Entrepreneurship.

Mechanical Engineering Program Description

To achieve the above stated objectives and outcomes, the School of Mechanical Engineering has developed a comprehensive, integrated curriculum to provide students with a broad base on which to build an engineering career. It is founded on basic sciences, including physics, chemistry and mathematics; computer science and computer graphics; and oral and written communications skills.

To this foundation, a core of engineering science and design courses are added in three main curriculum stems: mechanical sciences (statics, dynamics, mechanics of materials, and structures and properties of materials), information technologies (electric circuits and electronics, instrumentation, system modeling and controls), and thermal-fluid sciences (thermodynamics, fluid mechanics and heat transfer).

Throughout the core curriculum, students gain extensive laboratory and computer experience via modern facilities in all basic areas of the discipline. In addition, the curriculum provides an integrated innovation, design and entrepreneurship experience. This experience - which begins with a sophomore-level cornerstone course and culminates with a senior-level capstone course - emphasizes innovation, problem-solving, leadership, teamwork, communication skills, practical hands-on experience with various product design processes and entrepreneurship. Students then specialize by selecting two restricted electives that provide additional depth in two of the three main stems of the curriculum. Students can further specialize with 12 credit hours of technical/professional electives in engineering, mathematics, natural sciences, select management courses or individualized project courses (ME 49700).

Just as design experiences are integrated throughout the mechanical engineering curriculum, so too are opportunities to communicate technical information, both orally and in writing. Students experience a variety of communications opportunities in progressing through the mechanical engineering program.

As a freshman, each student is required to take both oral and written communication courses. These courses lay the foundation for future oral and written communications. In the sophomore seminar course (ME 29000), students learn how to create professional documents and correspondence (e.g., resumes, letters, memos, etc.), develop personal interview skills, learn the

basics of Web publishing and develop a global engineering professional profile. In ME 26300, the cornerstone design course, student teams prepare formal design reports, give oral presentations and maintain individual design notebooks. The communications experiences culminate in the capstone design course (ME 46300), in which student teams prepare presentations and reports for the sponsors of their selected design projects and compete in an innovation competition.

A major feature of the curriculum is the flexible 39-credit-hour elective program, of which 24 credit hours are taken during the senior year. This allows for a program with considerable breadth while also permitting the depth and specialization in an area of the student's professional interests.

Because of the wide scope of activities in which the mechanical engineer is engaged and because of the broad spectrum of student interests, mechanical engineering graduates may choose either to enter the profession immediately after receiving their bachelor's degree or go directly to graduate school. In either case, the curriculum provides a firm foundation for continuing education and fosters a commitment to lifelong learning, whether it is as a member of the engineering profession, through formal graduate work or through independent study.

Visit the School of Mechanical Engineering website for more current information about the undergraduate programs.

Scholarships

The School of Mechanical Engineering sponsors a broad array of need-based and merit-based scholarships. Eligible candidates (incoming sophomores through senior mechanical engineering students) are invited in mid-spring to submit applications for consideration. To qualify, students are required to have a scholastic index of 2.8 or better on a 4.0 scale. Awards range from $500 to $10,000 and total more than $1 million. This scholarship money is in addition to the University's Trustees and Presidential scholarships in Mechanical Engineering, which, when fully funded, will include more than 300 awards worth a total of more than $2 million.

Professional Student Organizations and Activities

Student organizations provide valuable opportunities for students to enhance organizational, communication, teamwork and leadership skills. Students also are strongly encouraged to become involved in one or more extracurricular activities. Student organizations specific to mechanical engineering include the American Society of Mechanical Engineers (ASME), the Purdue Mechanical Engineering Ambassadors (PMEA), Pi Tau Sigma (the Mechanical Engineering Honor Society) and the Society of Automotive Engineers (SAE).

Professional Practice Program with Industry or Governmental Organizations

The professional practice programs enable qualified students to obtain experiences related to their specific engineering discipline with selected employers while completing the requirements of their undergraduate degree. Students can participate in a five-session co-op, a three-session co-op or an internship program. International internships also are available through the Global Partners in Apprenticeship Learning (G-PAL) Program within the Office Professional Practice (OPP). OPP also offers the GEARE program, which combines domestic and international work experiences, a design project component and an opportunity to study abroad.
For more information, visit the Office of Professional Practice website.

Honors Program
An honors program is available for outstanding mechanical engineering undergraduate students. The honors program is a mechanism for:

- Participating in small enrollment, targeted courses.
- Participating in a directed project in their area of interest.
- Stimulating interest in graduate study and research/academic careers.
- Developing a community of honors scholars.

- Allowing for special recognition of high levels of academic achievement.

The Honors program utilizes the technical, general education and free elective requirements for the B.S.ME degree in a way that is consistent with the honors designation. Admission to the Honors program is automatic for any student meeting the admission requirements for the First-Year Engineering Honors program. Students not in the First-Year Engineering Honors program can apply for admission into the Honors program by completing an honors application and meeting the required cumulative GPA for admission.

Completion of the Honors program requires earning a required minimum number of honor points (credit hours) earned in one of the following manners:

- Take honors courses (including the sophomore and junior honors seminar sequence).
- Complete honors experiences (e.g., study abroad, special work experiences, etc.).
- Take honors strategic initiative courses (defined by the College of Engineering).

Successful completion of the minimum number of honors points will earn a student a certificate and his/her transcript will read, "Bachelor of Science Mechanical Engineering - Honors Program Awarded at West Lafayette."
More details on the Honors program can be found on the ME website.

Study Abroad
Global competency skills are a major focus in the School of Mechanical Engineering. By graduation, roughly 30 percent of ME graduates have international experience (as compared to about 3 percent nationally in engineering). The School of Mechanical Engineering has developed an extensive and multi-faceted study abroad program that ranges from an extensive eight-month experience abroad to a three-week stint abroad. This staged program allows students to pick and choose the program that best fits their requirements and timing. A brief summary of these programs are provided below. Additional information can be found on the ME Global Programs website.

GEARE Program. The Global Engineering Alliance for Research and Education (GEARE) program is the flagship international program. The GEARE program involves an eight-month experience abroad that includes both a domestic and international internship, a semester of study abroad with fully transferable engineering course credits (all taught in English) and a one-semester to two semester design team project with students from the international partner institution.

ETA Program. The Engineering Term Abroad (ETA) program is a one-semester study abroad at a partner institution and includes fully transferable engineering course credits (all taught in English). This enables participating students to continue with their engineering subjects and thus stay on track for graduation while still gaining international experience. Current partner institutions exist in Australia, China, England, France, Germany, India, New Zealand, Singapore, Spain and Turkey, among other locations and is our most popular international program.

RTA Program. The Research Term Abroad (RTA) program is designed to enable interested students to conduct undergraduate engineering research at a partner institution. Currently our primary partners are Hannover University and Clausthal University of Technology in Germany.

G-PAL Program. The Global Partners in Apprenticeship (G-PAL) program offers a pair of concurrent international internship positions, one for a student from the target international partner country and one for a student from the U.S. Preferably both students will be housed at the international student's home for the duration of the assignment abroad. The G-PAL students can also come from two different academic disciplines. Internships are typically three months to six months in duration.

MTA. Special Maymester Term Abroad (MTA) programs are available to select locations and provide students with a short three-week stint in a foreign country. Brief stints like this enable students to test the waters to see if they would be interested in a more protracted time abroad. As such, this program compliments other existing programs and provides a vehicle for students experience going abroad without a long-term commitment. Currently, the Maymester program involves international experiences in China.

Registration for the Fundamentals of Engineering Examination

Mechanical engineering seniors are strongly encouraged to take the first step to becoming registered professional engineers (PEs) by registering and successfully completing the Fundamentals of Engineering (FE) examination, also called the Engineer in Training (EIT) exam. Seniors can register to take the FE exam at the West Lafayette campus in their senior year prior to graduation. Announcements appear periodically throughout the semester to alert students to this opportunity. The FE exam can be taken daily at Purdue in the months of January/February, April/May, July/August, and October/November. To aid seniors in their preparation for the exam, Chi Epsilon, the Civil Engineering Honor Society organizes annual faculty-taught review sessions on key topics covered on the FE exam. Also, a simple internet search of FE Review Sessions can provide valuable review information available at a student's convenience. Typically, 50 to 75 percent of graduating mechanical engineering seniors register to take the FE exam, and 98 to 100 percent pass the exam on the first attempt.

After passing the FE exam and completing four years of engineering experience after graduation, an engineer is typically eligible to take the professional engineering (PE) licensing examination. Specific information about the EIT exam is available on the School of Mechanical Engineering home page. Questions about the FE Exam or the process to become a registered professional engineer should be directed to the Associate Head of the School of Mechanical Engineering.

Undergraduate Research Opportunities

In addition to the traditional classroom experience, students in the School of Mechanical Engineering have the opportunity to conduct cutting-edge research in one of the thirteen ME Research Areas listed below:

- Acoustics and Noise Control
- Bioengineering
- Combustion
- Design
- Fluid Mechanics and Propulsion
- Heat Transfer
- Heating, Ventilation, Air Conditioning and Refrigeration
- Manufacturing and Materials Processing
- Mechanics and Vibrations
- Nanotechnology
- Robotics
- Solid Mechanics
- Systems, Measurement and Control

Students discover first-hand how research contributes to the advancement of human knowledge. They experience a change of pace from formal classroom activities and gain valuable hands-on skills applicable to both research and non-research careers. In addition, students develop their knowledge of the research process and tools used by professional researchers and increase their proficiencies in technical communication. Such experiences help students connect their summer experience with their future goals, with particular focus on post-graduate education.

Interested students are strongly encouraged to consider participation in the Summer Undergraduate Research Fellowship (SURF) Program or the Discovery Park Undergraduate Research Internship (DURI) Program. To find Purdue faculty who are active in these areas, please visit the Indiana Database of University Research Expertise (INDURE). Use the advanced search to filter results by keyword, area, grants, etc.

Preparation for Graduate Study

The School of Mechanical Engineering also offers graduate work leading to the degrees of Master of Science (M.S.), for students with non-engineering degrees; Master of Science in Engineering (M.S.E), for students with non-mechanical engineering degrees; Master of Science in mechanical engineering (M.S.ME), for students with B.S.ME degrees; and the Doctor of Philosophy (Ph.D.).

The regular undergraduate curriculum (and the honors undergraduate program) provide a strong foundation for graduate study, and students who complete either of the programs with appropriate academic records are encouraged to pursue graduate work. Many graduates have continued their education by pursuing advanced studies in engineering, business, law, medicine, dentistry and public policy.

For answers to your questions about graduate study, visit the Mechanical Engineering Graduate Office in the Mechanical Engineering Building, Room 1003, call 765-494-5730, email megrad@ecn.purdue.edu or visit the ME website.

Combined B.S.ME/M.S.ME Program

A combined B.S.ME/M.S.ME program is available for outstanding mechanical engineering undergraduate students. This program is anticipated to take approximately five years to complete (with the M.S.ME non-thesis option) and result in receiving both the B.S.ME and M.S.ME degrees.

The B.S.ME/M.S.ME program is a mechanism for:

A. Providing a seamless transition from the B.S.ME to the M.S.ME program.
B. Participating in a directed project in their area of interest.
C. Stimulating interest in graduate study and research/academic careers.
D. Allowing for special recognition of high levels of academic achievement.

The B.S.ME/M.S.ME program requires students to take 12 hours of graduate coursework toward their B.S.ME professional elective requirement. This same 12 hours likewise count toward the M.S.ME degree.
Interested students typically apply as an "internal ME applicant" in the second half of their junior year after completion of 81 hours of coursework in the undergraduate program with a cumulative undergraduate GPA of 3.2 or higher. If a GPA of 3.0 has been maintained and grades of "B" or better are received in the first two graduate courses (typically in the seventh semester), the student will be asked to formally apply to the Purdue Graduate School at the beginning of his or her eighth semester of the senior year.

Complete details of the combined B.S.ME/M.S.ME program can be found on the Web. Questions about this information should be directed to Julayne Moser, email: moser@purdue.edu.

B.S.ME/M.B.A. 5-Year Program

The School of Mechanical Engineering in conjunction with the Krannert School of Management offers an integrated five-year B.S.ME/M.B.A. program to high-achieving students, Each year a significant number of engineering graduates pursue M.B.A.s at U.S. business schools. The M.B.A. is seen as a complement to the engineer's technical education, providing an understanding of the business context within which many technical decisions are made. Many employers also have a strong preference for hiring M.B.A.s with engineering backgrounds, particularly in the manufacturing and technology sectors, in which Krannert and the College of Engineering enjoy many longstanding relationships with leading employers. The B.S.ME/M.B.A. combined degree offering will provide top B.S.ME students an efficient and cost-effective path for developing management knowledge as well as the highly valued credential of an M.B.A. degree. It will also open new job opportunities for the program graduates that expedite their progression to high-level management positions.

Basic admission requirements include:

1. Maintaining a 3.5 graduation GPA.
2. Securing at least one session of internship and/or co-op work experience prior to the senior year.
3. Securing advanced credit (preferably math) or willingness to accelerate your ME program by taking summer courses.
4. Completing an application and successfully interviewing for a position with the Krannert School of Management faculty.

More details about the B.S.ME/M.B.A. program are available online.

Degree Requirements

128 Credits Required

Mechanical Engineering Major Courses (43 credits)

All ME courses are critical courses.

- ME 20000 - Thermodynamics I
- ME 27000 - Basic Mechanics I
- ME 26300 - Introduction To Mechanical Engineering Design, Innovation And Entrepreneurship
- ME 27400 - Basic Mechanics II
- ME 29000 - Global Engineering Professional Seminar
- ME 30900 - Fluid Mechanics

- ME 30000 - Thermodynamics II 2 of 3 required - Satisfies Restricted Selective requirements
  or
- ME 45200 - Machine Design II 2 of 3 required - Satisfies Restricted Selective requirements
  or
- ME 47500 - Automatic Control Systems 2 of 3 required - Satisfies Restricted Selective requirements

- ME 31500 - Heat And Mass Transfer
- ME 32300 - Mechanics Of Materials
- ME 35200 - Machine Design I
- ME 36500 - Measurement And Control Systems I
- ME 37500 - Measurement And Control Systems II
- ME 46300 - Engineering Design

ME Professional Selectives (12 credits)

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- Technical Elective IV - Credit Hours: 3.00

First-Year Engineering Course Requirements (29-30 credits)

- CHM 11500 - General Chemistry (Science Outcome I)
- Oral Communication Selective - COM 11400 - Fundamentals Of Speech Communication Recommended (Oral Communication Outcome) *
- Written Communication Selective - ENGL 10600 - First-Year Composition Recommended - (Written Communication Outcome) *
- ENGR 13100 - Transforming Ideas To Innovation I (Information Literacy Outcome)

- ENGR 13200 - Transforming Ideas To Innovation II
- MA 16500 - Analytic Geometry And Calculus I (Quantitative Reasoning Outcome)
- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics (Science Outcome II)

Science Selective

Select one from list (all options accepted).

- BIOL 11000 - Fundamentals Of Biology I
- CHM 11600 - General Chemistry
- CS 15900 - Programming Applications For Engineers

Other School/Department Course Requirements (23 credits)

- CGT 16300 - Graphical Communication And Spatial Analysis (Not included in ME Core GPA)
- ECE 20100 - Linear Circuit Analysis I
- ECE 20700 - Electronic Measurement Techniques
- MA 26100 - Multivariate Calculus
- MA 26200 - Linear Algebra And Differential Equations
- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences
- MSE 23000 - Structure And Properties Of Materials
- PHYS 24100 - Electricity And Optics

General Education Selectives (18 credits)

- Econ Sel. (B/SS) - Credit Hours: 3.00
- WAC (*Hum*) - Credit Hours: 3.00
- G.E.-I - Credit Hours: 3.00
- G.E.-II - Credit Hours: 3.00
- G.E.-III - Credit Hours: 3.00
- G.E.-IV - Credit Hours: 3.00

Electives (3 credits)

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society

- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Requirements

Select below for additional lists:

- Mechanical Engineering BSME GenEd Electives.pdf
- Mechanical Engineering BSME Restricted Electives.pdf
- Mechanical Engineering BSME Tech Electives.pdf
- Mechanical Engineering BSME WAC Electives.pdf

Program Requirements

Fall 1st Year

- CHM 11500 - General Chemistry (Science Outcome I)
- ENGL 10600 - First-Year Composition Recommended (Written Communication)
- ENGR 13100 - Transforming Ideas To Innovation I (Informational Literacy)
- MA 16500 - Analytic Geometry And Calculus I (Quant. Reason.)
- General Education Sel. I - Credit Hours: 3.00 (Recommendation for Summer Session)

16 Credits

Spring 1st Year

- ENGR 13200 - Transforming Ideas To Innovation II
- Oral Communication - COM 11400 - Fundamentals Of Speech Communication Recommended (Oral Communication)
- MA 16600 - Analytic Geometry And Calculus II
- PHYS 17200 - Modern Mechanics (Science II)
- Science Selective - Credit Hours: 3.00-4.00
- Recommend Gen Ed Sel I and Internship for Summer Semester

16-18 Credits

Fall 2nd Year

- CGT 16300 - Graphical Communication And Spatial Analysis
- MA 26100 - Multivariate Calculus
- ME 20000 - Thermodynamics I ♦
- ME 27000 - Basic Mechanics I ♦
- ME 29000 - Global Engineering Professional Seminar ♦
- PHYS 24100 - Electricity And Optics

16 Credits

Spring 2nd Year

- ECE 20100 - Linear Circuit Analysis I
- ECE 20700 - Electronic Measurement Techniques
- MA 26200 - Linear Algebra And Differential Equations
- ME 26300 - Introduction To Mechanical Engineering Design, Innovation And Entrepreneurship ♦
- ME 27400 - Basic Mechanics II ♦
- Gen Ed El - Credit Hours: 3.00 (Recommendation for Summer Session)
- Internship recommended for Summer Session

17 Credits

Fall 3rd Year

- MA 30300 - Differential Equations And Partial Differential Equations For Engineering And The Sciences
- ME 30900 - Fluid Mechanics ♦
- ME 32300 - Mechanics Of Materials ♦
- ME 36500 - Measurement And Control Systems I ♦
- Econ El - Credit Hours: 3.00 (Recommendation for Summer Session)

16 Credits

Spring 3rd Year

- ME 35200 - Machine Design I ♦
- ME 37500 - Measurement And Control Systems II ♦
- MSE 23000 - Structure And Properties Of Materials
- Technical Elective I - Credit Hours: 3.00

- World Affairs and Cultures (Humanities) El - Credit Hours: 3.00
- Recommend Internship for Summer Session

16 Credits

Fall 4th Year

- ME 31500 - Heat And Mass Transfer ♦
- Restricted Selective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- General Education Sel. III - Credit Hours: 3.00
- Free Elective - Credit Hours: 3.00

16 Credits

Spring 4th Year

- ME 46300 - Engineering Design ♦
- Restricted Selective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- Technical Elective IV - Credit Hours: 3.00
- General Education Selective IV - Credit Hours: 3.00

15 Credits

Notes

2.0 Graduation GPA required for Bachelor of Science degree

2.0 ME Core GPA required for Bachelor of Science degree

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

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Minor

Engineering and Public Policy Minor

21 Credits Required

A minor in Engineering and Public Policy is available to students in the College of Engineering.

Requirements for the Minor

Required Courses (15 credits)

- CE 35500 - Engineering Environmental Sustainability
- ME 49200 - Technology And Values (Offered alternate spring sems.)
- PHIL 27000 - Biomedical Ethics
- POL 12000 - Introduction To Public Policy And Public Administration
- POL 22300 - Introduction To Environmental Policy

Additonal Courses (6 credits)*

Public Policy (3 credits)

- PHIL 29000 - Environmental Ethics
- POL 32700 - Global Green Politics (recommended)
- POL 42500 - Environmental Law And Politics
- POL 52300 - Environmental Politics And Public Policy

Technical (3 credits)

- ABE 58000 - Process Engineering Of Renewable Resources
- ABE 59100 - Special Topics
- CE 35000 - Introduction To Environmental And Ecological Engineering
- CE 35200 - Biological Principles Of Environmental Engineering
- CE 35300 - Physico-Chemical Principles Of Environmental Engineering
- CE 36100 - Transportation Engineering
- CE 45600 - Wastewater Treatment Processes
- CE 45700 - Air Pollution Control And Design
- CE 52400 - Legal Aspects In Engineering Practice
- ECE 59500 - Selected Topics In Electrical Engineering Physics and Manufacturing of Solar Cells

- ME 49700 - Mechanical Engineering Projects Energy in a Global Context
- ME 59700 - Advanced Mechanical Engineering Projects I Sustainable Energy Options and Analysis
- NUCL 20000 - Introduction to Nuclear Engineering
- ME 59700 - Advanced Mechanical Engineering Projects I Solar Energy
- ME 59700 - Advanced Mechanical Engineering Projects I Bio-energy and Bio-fuels
- ME 59700 - Advanced Mechanical Engineering Projects I Wind Energy and Turbines

Notes

* All courses must be completed with a grade of "C" or better. A grade of "C- or lower" in any of the minor courses is not adequate..

Generally all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus to be eligible for the Engineering and Public Policy Minor. The only exceptions to this rule are as follows:

1. One equivalent transfer course from another university can be used if it is a core course and comes from an ABET-accredited program, OR
2. One equivalent Purdue substitution may be used if it is deemed equivalent to the prescribed minor course and acceptable by the home School of the student.

No more than one substitution from either of the above two categories is acceptable for the Engineering and Public Policy Minor.

Engineering students interested in the Public Policy Minor are strongly encouraged to consider pursuing an internship with the **WISE Program** (Washington Internships for Students of Engineering). Go to http://www.wise-intern.org/ for details or google the Program name. Applications for consideration are typically due at the end of December of each year for the upcoming summer.

All students interested in the Public Policy Minor are strongly encouraged to consider pursuing an internship with the **White House Internship Program**. Go to http://www.whitehouse.gov/about/internships/ for details. Submission deadline for applications is typically in March of each year for the upcoming summer.

Students interested in the Engineering and Public Policy Minor are encouraged to become active in the **Purdue Student Pugwash** organization (http://web.ics.purdue.edu/~pugwash/). Pugwash is an organization started by Bertrand Russell, Albert Einstein, and several other eminent scientists committed to social responsibility in science and technology.

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Global Engineering Studies Minor

The Global Engineering Studies Minor is designed for engineering students to be able to document significant demonstrated global experience and professional growth while at Purdue.

To qualify for this Minor, students will participate in a comprehensive program integrating substantial on-campus and international (non-native) experiences. To earn the Minor, students must complete ENGR 31000 - Engineering In Global Context as a core requirement. They will also select and complete: a) any TWO options from the first (Global Engineering Experience) category listed below, and any ONE option from the second (Other Global Experience) category, OR b) any THREE options from the first category (Global Engineering Experience). As a final core requirement, students must enroll in and complete ENGR 49700 - Global Engineering Re-Entry.

Requirements for the Minor

Core Requirements

- **ENGR 31000** - Completion of ENGR31000, Engineering in Global Context (3 credit-hours, offered most semesters). Students are strongly encouraged to take this course within a year of declaring their intent to pursue the Minor, and prior to any travel-based experiences (e.g., study, work, or research abroad). Students permitted to take ENE 55400 (Globalization and Engineering) may use it as a substitute for this course. Students in the GEARE program may substitute ME 29700 (Global Engineering Orientation - GEARE) for this course.[1]
- **ENGR 49700** - Successful completion of ENGR49700, Global Engineering Re-entry (1 credit-hour, offered on demand). Involves preparation and presentation of final, culminating documentation of the student's experiences and competency development while fulfilling the Minor requirements, such as in the form of an electronic portfolio or poster. Detailed instructions and guidelines related to this requirement are provided to students upon entry to the Minor. For questions about enrolling in ENGR49700, please contact gep@purdue.edu.

Elective Requirements

Global Engineering Experience - Choose any two

- **Engineering Term Abroad** - One term of study abroad with 6 or more credits of engineering-related coursework at a strategic global university partner. The list of strategic global university partners is maintained and continuously updated by the Global Engineering Program Team (GEPT).
- **Departmental Study Abroad** - Short-term study abroad experience offered in the College of Engineering, typically occurring during winter break, spring break, or Maymester. Must involve enrollment in 3 or more credits.
- **International Engineering Internship** - One international internship at a strategic global industry partner or under the auspices of a global organization, of duration two or more months. The list of the strategic industry partners and global organizations is maintained and continuously updated by the Global Engineering Program Team (GEPT).
- **Research Term Abroad** - One term of research abroad (e.g., as in the Hannover or Clausthal programs).
- **International Engineering Design Project** - Successful participation in at least 2 credits of project work with a global partner. The key objective is to enable and recognize the intense, personal experience of working with students and/or professionals from a different culture over an extended period of time on a project where the global context of the work is essential. As part of the global project work, students must submit a written technical report and/or give an oral presentation. Most students will meet this requirement through participation in Global Design Teams (GEP 10000-GEP 40000), global EPICS (EPCS 10100-EPCS 41200), or a senior capstone project.

Other Global Experience - Choose one, OR select a third option from the GEE list

- **Traditional Study Abroad** - One term of any traditional study abroad program is acceptable for this option.
- **Language Proficiency** - Demonstrate proficiency in a second language up to the 202 course level in at least one non-native language. The 12 credit requirement include credits established by examination. The 12 credits of language courses will normally be completed before the student participates in study or professional practice experiences abroad.
- **Cultural Knowledge** - Demonstrate proficiency in an understanding of cultures by completing 12 credits of coursework in culture-oriented courses. The 12 credits can include credits established by examination, but at least 6 of

the 12 credits must be taken at Purdue-West Lafayette. A list of approved Cultural Knowledge courses appears as Appendix A below, and will be reviewed and updated annually to reflect ongoing changes in course availability.

Appendix A: Cultural Knowledge Courses

This is a representative rather than complete list of Cultural Knowledge courses. If you have questions about whether other courses qualify, contact Prof. Jim Jones (jonesjd@purdue.edu).

African

- HIST 21000 - The Making Of Modern Africa
- HIST 34100 - History Of Africa South Of The Sahara
- HIST 34200 - Africa And The West
- HIST 35700 - History Of Southern Africa Since 1400
- HIST 36101 - Violence, War, And Militarism In Modern Africa
- HIST 43000 - Women In African History
- HIST 44100 - Africa In The Twentieth Century

Arabic

- ARAB 23900 - Arab Women Writers
- ARAB 28000 - Arabic Culture
- ARAB 33400 - North African Literature And Culture
- HIST 24300 - South Asian History And Civilizations
- HIST 24500 - Introduction To The Middle East History And Culture
- HIST 24600 - Modern Middle East And North Africa
- HIST 36000 - Gender In Middle East History
- HIST 45500 - Modern Iraq

Chinese

- CHNS 28000 - Topics in Chinese Civilization and Culture
- HIST 33900 - Traditional China
- HIST 34000 - Modern China
- HIST 43900 - Communist China
- HIST 24100 - East Asia In The Modern World
- HIST 35900 - Gender In East Asian History

Classics

- CLCS 33900 - Literature And The Law
- CLCS 38100 - Julius Caesar: Statesman, Soldier, Citizen
- CLCS 48000 - Potters And Society In Antiquity
- GREK 10200 - Ancient Greek Level II

- GREK 20200 - Ancient Greek Level IV
- GREK 44600 - Greek Historians
- LATN 44300 - Roman Satire

European

- HIST 10300 - Introduction To The Medieval World
- HIST 10400 - Introduction To The Modern World
- HIST 31200 - The Crusades
- HIST 31700 - A History Of The Christian Church And The Expansion Of Christianity I
- HIST 31800 - A History Of The Christian Church And The Expansion Of Christianity II
- HIST 32000 - The World Of Charlemagne
- HIST 32200 - Monarchy: Its Rise And Fall
- HIST 32700 - The Habsburg Legacy: Central Europe, 1500-2000
- HIST 32800 - History Of Women In Renaissance Europe
- HIST 32900 - History Of Women In Modern Europe
- HIST 33000 - History Of The British Empire And Commonwealth, 1783 To 1960
- HIST 33700 - Europe In The Age Of The Cold War
- HIST 40300 - Europe In The Reformation
- HIST 40400 - Kings And Philosophers: Europe 1618-1789
- HIST 40600 - Rebels And Romantics: Europe 1815-1870
- HIST 40800 - Dictatorship And Democracy: Europe 1919-1945
- HIST 41100 - The Four Horsemen Ride: Crisis And Change In Europe 1300-1648
- HIST 41200 - The Cultural History Of The Middle Ages
- HIST 41300 - Modern European Imperialism: Repression and Resistance
- HIST 41800 - European Society And Culture 1450-1800

French

- FR 33000 - French Cinema
- HIST 32400 - Modern France
- HIST 40500 - The French Revolution And Napoleon

German

- GER 28000 - German Special Topics
- HIST 32300 - German History
- HIST 42300 - Advanced Topics In Modern Germany

Hebrew

- HEBR 38500 - The Holocaust In Modern Hebrew Literature
- HIST 39001 - Jews In The Modern World: A Survey Of Modern Jewish Society, Culture, And Politics

Italian

- ITAL 23100 - Dante's Divine Comedy
- ITAL 28100 - The Italian Renaissance And Its Scientific And Cultural Impact On Western Civilization
- ITAL 33000 - The Italian Cinema
- ITAL 33300 - The Spirit Of Italian Comedy
- ITAL 33500 - Italian-American Cinema

Japanese

- JPNS 28000 - Introduction To Modern Japanese Civilization
- HIST 34300 - Traditional Japan
- HIST 34400 - History Of Modern Japan

Latin American

- HIST 27100 - Introduction To Colonial Latin American History (1492-1810)
- HIST 27200 - Introduction To Modern Latin American History (1810 To The Present)

Portuguese

- PTGS 33000 - Brazilian, Portuguese, And African Cinema

Russian

- RUSS 33000 - Russian And East European Cinema
- HIST 39100 - History Of Russian Popular Entertainment

Spanish

- SPAN 23100 - Cervantes' Don Quixote
- SPAN 23500 - Spanish American Literature In Translation
- SPAN 33000 - Spanish And Latin American Cinema
- HIST 42700 - History Of Spain And Portugal
- HIST 47200 - History Of Mexico

Notes

[1] Students who leave the GEARE program without completing the global internship/research requirement may still be able to complete the Global Engineering Studies Minor. For details see: "Completing the Global Engineering Studies Minor after withdrawing from GEARE."

A grade of "C" or better in all courses that are counted toward the minor.

Disclaimer

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Intellectual Property Law for Engineers Minor

19 Credits Required

A minor in Intellectual Property Law is available to students in the College of Engineering.

Requirements for the Minor

Required Courses (13 credits)

- ENTR 20000 - Introduction To Entrepreneurship And Innovation
- ME 49200 - Technology And Values
- ME 55400 - Intellectual Property For Engineers
- POL 46000 - Judicial Politics **
- ENGL 42100 - Technical Writing

Prerequisite Information

** Students with knowledge of American Government from high school may seek a waiver of the POL 10100 prerequisite. This exception is not guaranteed, but can be sought from the instructor of POL 46000.

Elective Courses (6 credits)

Law (3 credits)

- POL 10100 - American Government And Politics
- POL 42800 - The Politics Of Regulation (Recommended)
- POL 46100 - Constitutional Law I (Recommended)
- POL 46200 - Constitutional Law II

Technical (3 credits)

- ECE 38200 - Feedback System Analysis And Design
- ECE 48300 - Digital Control Systems Analysis And Design
- IE 37000 - Manufacturing Processes I
- ME 36300 - Principles And Practices Of Manufacturing Processes
- ME 44400 - Computer-Aided Design And Prototyping
- ME 45200 - Machine Design II
- ME 47500 - Automatic Control Systems
- ME 55300 - Product And Process Design
- ME 55700 - Design For Manufacturability
- ME 56000 - Kinematics
- ME 56100 - Optimal Design: Theory With Practice
- ME 57000 - Machine Design
- ME 57100 - Reliability Based Design
- ME 57200 - Analysis And Design Of Robotic Manipulators
- ME 57500 - Theory And Design Of Control Systems
- ME 57600 - Computer Control Of Manufacturing Processes
- ME 58500 - Instrumentation For Engineering Measurements
- ME 58600 - Microprocessors In Electromechanical Systems
- ME 58800 - Mechatronics - Integrated Design Of Electro-Mechanical Systems

Notes

Generally, all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus to be eligible for the Intellectual Property Law Minor. The only exceptions to this rule are as follows: 1. One equivalent transfer course from another university can be used if it is a core course and comes from an ABET-accredited program, or 2. One equivalent Purdue substitution may be used if it is deemed equivalent to the prescribed minor course and acceptable by the home School of the student. Note: No more than one substitution from either of the above two categories is acceptable for the Intellectual Property Law Minor.

* Courses must be completed with a grade of "C" or better. A grade of "C- or lower" is not adequate to fulfill the minor.

Advising - Students interested in pursuing a career in a Intellectual Property Law are strongly recommend to contact Mark Janis (BS ChE 1986, Purdue University; Professor of Law and Ira C. Batman Faculty Fellow, Indiana University Maurer School of Law 1989, mdjanis@indiana.edu; http://www.law.indiana.edu/) early in their academic program to discuss specific Schools of interest, the applications process, the interview process, and the admission exam (LSATS, etc.)

Disclaimer

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Manufacturing Minor

18 Credits Required

A minor in Manufacturing is available to students in the College of Engineering and School of Technology.

Requirements for the Minor

Core Courses (6 credits)

- MSE 23000 - Structure And Properties Of Materials
- MFET 30000 - Applications Of Automation In Manufacturing

And choose one of the following (3 credits)

- IE 37000 - Manufacturing Processes I
- ME 36300 - Principles And Practices Of Manufacturing Processes

And choose from the following approved elective requirements* (9 credits)

Manufacturing Processes, Systems and Planning

- ABE 50100 - Welding Engineering
- IE 47000 - Manufacturing Processes II
- ME 55700 - Design For Manufacturability
- MFET 44600 - Advanced Manufacturing Operations

Automated Manufacturing and Integration

- IE 57400 - Industrial Robotics And Flexible Assembly
- ME 57600 - Computer Control Of Manufacturing Processes
- MET 28400 - Introduction To Industrial Controls
- MFET 34800 - Advanced Industrial Robotics
- MFET 37400 - Manufacturing Integration I

Advanced Manufacturing

- ME 50700 - Laser Processing
- MET 44600 - Micro And Nano Manufacturing
- MET 49000 - Special Topics In MET

Computer-Aided Design in Manufacturing

- ME 44400 - Computer-Aided Design And Prototyping
- MFET 34200 - Advanced Manufacturing Processes And Practices

Quality Control

- IE 53000 - Quality Control
- MET 45100 - Manufacturing Quality Control

Notes

Must receive a grade of "C" or better in all of the courses.

A grade of "C-" in any of the minor courses is not adequate to fulfill the minor.

Generally, all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus to be eligible for the Manufacturing Minor.

The only exceptions to this rule are as follows:

1. One equivalent transfer course from another university can be used if it is a core course and comes from an ABET-accredited program, OR

2. One equivalent Purdue substitution may be used if it is deemed equivalent to the prescribed minor course and acceptable by the home School of the student.

No more than one substitution from either of the above two categories is acceptable to be eligible for the Manufacturing Minor.

Disclaimer

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

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

Sustainable Engineering Minor

18 Credits Required

Requirements for the Minor

Required Courses (12 credits)

- CE 35500 - Engineering Environmental Sustainability
- EEE 43000 - Industrial Ecology And Life Cycle Analysis
- AGEC 40600 - Natural Resource And Environmental Economics
- POL 32700 - Global Green Politics

One of the following from Public Policy (3 credits)

Public Policy

- PHIL 29000 - Environmental Ethics
- POL 22300 - Introduction To Environmental Policy
- POL 42500 - Environmental Law And Politics
- POL 52300 - Environmental Politics And Public Policy

One from Technical Courses (3 credits)

Sustainable Energy Options

- ABE 58000 - Process Engineering Of Renewable Resources
- ABE 59100 - Special Topics Variable Title in Biomass Feedstock Systems Engineering
- CHE 55800 - Rate-Controlled Separation Processes
- CHE 59700 - Special Topics In Chemical Engineering Variable Title course in Advanced Solar Energy Conversion
- ECE 59500 - Selected Topics In Electrical Engineering Variable Title in Physics and Manuafacturing of Solar Cells
- ME 59700 - Advanced Mechanical Engineering Projects I Variable Title course worth 3 credits each, with the following topics:
- Bio-energy and Bio-fuels
- Solar Energy
- Sustainable Energy Options and Analysis
- Wind Energy and Turbines

Sustainable Design and Construction

- AD 39700 - Sustainability In The Built Environment
- BCM 41900 - Sustainable Construction
- ME 55300 - Product And Process Design
- CE 59700 - Civil Engineering Projects Variable Title course in Sustainable Building Design Construction and Operation
- ME 59700 - Advanced Mechanical Engineering Projects I Variable Title course in Sustainable Design and Manufacturing

Energy Utilization and Equipment

- ECET 58100 - Workshop In Electrical And Computer Engineering Technology
- ME 44000 - Automotive Prime Movers: Green Engines And Clean Fuel

Agricultural/Environmental Sustainability

- ASM 33600 - Environmental Systems Management
- BIOL 48300 - Great Issues: Environmental And Conservation Biology
- CE 59700 - Civil Engineering Projects Variable Title in Water Resources Sustainability

Energy Conversion and Storage

- NUCL 47000 - Fuel Cell Engineering
- NUCL 56300 - Direct Energy Conversion

- MSE 59700 - Selected Topics In Materials Engineering Materials and Devices for Solid State Energy Conversion
  or
- ECE 59500 - Selected Topics In Electrical Engineering Materials and Devices for Solid State Energy Conversion

Notes

* A grade of "C" or better is required in all of the courses. A grade of "C- or lower" in any of the minor courses is not adequate to fulfill the minor.

A Sustainable Engineering Minor is available to students in the College of Engineering.

Generally, all of the above prescribed minor courses must be taken at the Purdue West Lafayette campus to be eligible for the Sustainable Engineering Minor. The only exceptions to this rule are as follows:

1. One equivalent transfer course from another university can be used if it is a core course and comes from an ABET-accredited program, OR
2. One equivalent Purdue substitution may be used if it is deemed equivalent to the prescribed minor course and acceptable by the home School of the student.

No more than one substitution from either of the above two categories is acceptable for the Sustainable Engineering Minor.

Finally, as new courses are developed on campus, interested students can request a review by the Undergraduate Chairs Committee of any new courses with substantial engineering sustainability emphasis to be considered as elective options for the minor. Please contact Jim Jones (jonesjd@purdue.edu) in ME to submit your request.

Disclaimer

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School of Nuclear Engineering

An Overview

Nuclear engineering is firmly grounded in the understanding and application of modern physics. It has demonstrated vast potential for growth in power generation, medicine, industrial processes, plasmas, space technologies, and national defense.

Nuclear engineers at Purdue contribute to such advanced technologies as fission and fusion power generators, new medical technologies and procedures, improved food safety, advanced materials processing, advanced imaging, and the safe treatment and disposal of spent nuclear fuel.

Indiana's first and only nuclear reactor has its home in Purdue University's Electrical Engineering Building. It headlines field trips for high-school juniors and seniors who participate in demonstrations and experiments. Students in the undergraduate program have an opportunity to work with the reactor in their courses.

Faculty

https://engineering.purdue.edu/NE/People/faculty.html

Contact Information

Student Services Office:
School of Nuclear Engineering
Purdue University
400 Central Drive, Room 132G
West Lafayette, IN 47907-2017
Phone: (765) 494-5749
Fax: (765) 494-9570

Email regarding academic programs: nuclss@purdue.edu

General Contact Information:
School of Nuclear Engineering

https://engineering.purdue.edu/NE

Purdue University
400 Central Drive, Room 140
West Lafayette, IN 47907-2017
Phone: (765) 494-5739
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Email regarding general information: ne@purdue.edu
Purdue University
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Graduate Information

For Graduate Information please see Nuclear Engineering Graduate Program Information.

Baccalaureate

Nuclear Engineering, BSNE

About the Program

Baccalaureate Plan of Study

https://engineering.purdue.edu/NE/academics/undergraduate/pos

Degree Requirements

125 Credits Required

Nuclear Engineering Major Courses (41 credits)

Required NUCL Courses + NE Technical Electives + Other Departmental/Program Course Requirements = 113 Credit Hours of Nuclear Engineering Major Courses

https://engineering.purdue.edu/NE/foryou/undergraduate

Required Major Courses (41 credits)

- NUCL 20000 - Introduction to Nuclear Engineering
- NUCL 20500 - Nuclear Engineering Undergraduate Laboratory I
- NUCL 27300 - Mechanics Of Materials
- NUCL 29800 - Sophomore Seminar
- NUCL 30000 - Nuclear Structure And Radiation Interactions
- NUCL 30500 - Nuclear Engineering Undergraduate Laboratory II
- NUCL 31000 - Introduction To Neutron Physics
- NUCL 44900 - Senior Design Proposal
- NUCL 49800 - Senior Seminar
- NUCL 40200 - Engineering Of Nuclear Power Systems

- NUCL 32000 - Introduction To Materials For Nuclear Applications
- NUCL 32500 - Nuclear Materials Laboratory
- NUCL 35000 - Nuclear Thermal-Hydraulics I
- NUCL 35100 - Nuclear Thermal-Hydraulics II
- NUCL 35500 - Nuclear Thermohydraulics Laboratory
- NUCL 39800 - Junior Seminar
- NUCL 45000 - Design In Nuclear Engineering

- NUCL 51000 - Nuclear Reactor Theory I
  or
- NUCL 42001 - Radiation Interaction With Materials And Applications

Other Departmental/Program Course Requirements (57 credits)

- MA 16500 - Analytic Geometry And Calculus I (satisfies FYE requirement)
  or
- MA 16100 - Plane Analytic Geometry And Calculus I (satisfies FYE requirement) (Satisfies UCC: Quant Reasoning)

- MA 16600 - Analytic Geometry And Calculus II (satisfies FYE requirement)
  or
- MA 16200 - Plane Analytic Geometry And Calculus II (satisfies FYE requirement)

- CHM 11500 - General Chemistry (Satisfies UCC: Science)
- ENGR 13100 - Transforming Ideas To Innovation I (satisfies FYE requirement)
- ENGR 13200 - Transforming Ideas To Innovation II (satisfies FYE requirement)

- ENGL 10600 - First-Year Composition (satisfies FYE requirement) (Satisfies UCC: Written Communication and UCC: Information Literacy)
  or
- ENGL 10800 - Accelerated First-Year Composition (satisfies FYE requirement)
  or
- COM 20400 - Critical Perspectives On Communication (satisfies FYE requirement)
  or
- HONR 19903 - Interdisciplinary Approaches In Writing (satisfies FYE requirement)

- COM 11400 - Fundamentals Of Speech Communication (satisfies FYE requirement) (Satisfies UCC:Oral Communication)
  or
- COM 21700 - Science Writing And Presentation (satisfies FYE requirement)

- PHYS 17200 - Modern Mechanics (satisfies FYE requirement)
- CS 15900 - Programming Applications For Engineers (satisfies FYE requirement)
- MA 26100 - Multivariate Calculus (satisfies Math and physics requirement)
- MA 26500 - Linear Algebra (satisfies Math and physics requirement)
- MA 26600 - Ordinary Differential Equations (satisfies Math and physics requirement)
- PHYS 24100 - Electricity And Optics (satisfies Math and physics requirement)

or

- PHYS 27200 - Electric And Magnetic Interactions (satisfies Math and physics requirement)
- ECE 20100 - Linear Circuit Analysis I
- ME 20000 - Thermodynamics I
- ME 27000 - Basic Mechanics I
- ME 27400 - Basic Mechanics II
- MA Elective - 300 level or above - Credit Hours: 3.00

NE Technical Electives (15 credits)

Technical Elective List

- Technical Elective I - Credit Hours: 3.00
- Technical Elective II - Credit Hours: 3.00
- Technical Elective III - Credit Hours: 3.00
- Technical Elective IV - Credit Hours: 3.00
- Technical Elective V - Credit Hours: 3.00

General Electives (12 credits)

(6 in Social sciences and 6 In Humanities)*

- Lower level Humanities - Credit Hours: 3.00
- Upper level Humanities - Credit Hours: 3.00
- Lower level Social Sciences - Credit Hours: 3.00
- Upper level Social Sciences - Credit Hours: 3.00

*University Core Courses can be applied to fulfill some of these requirements (UCC: Behavior Social Sciences, UCC: Humanities, and UCC: Science, Tech & Society). A maximum of 6 TR, CR, DC credits can be applied to the General Elective requirements.

University Core Requirements

- Human Cultures Humanities
- Human Cultures Behavioral/Social Science
- Information Literacy
- Science #1
- Science #2
- Science, Technology, and Society
- Written Communication
- Oral Communication
- Quantitative Reasoning
- For a complete listing of course selectives, visit the Provost's Website.

Prerequisite Information:

For current pre-requisites for courses, click here.

Additional Requirements

Select Nuclear Engineering BSNE Nuclear Engineering General Education Requirements.pdf and Nuclear Engineering BSNE Nuclear Engineering Technical Electives.pdf for additional lists.

Program Requirements

Fall 1st Year

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

- ENGL 10600 - First-Year Composition
  or
- ENGL 10800 - Accelerated First-Year Composition
  or
- COM 20400 - Critical Perspectives On Communication
  or
- HONR 19903 - Interdisciplinary Approaches In Writing

- CHM 11500 - General Chemistry
- ENGR 13100 - Transforming Ideas To Innovation I

13-17 Credits

Spring 1st Year

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

- COM 11400 - Fundamentals Of Speech Communication
  or
- COM 21700 - Science Writing And Presentation

- CS 15900 - Programming Applications For Engineers
- ENGR 13200 - Transforming Ideas To Innovation II
- PHYS 17200 - Modern Mechanics

14-17 Credits

Fall 2nd Year

- NUCL 29800 - Sophomore Seminar
- General Elective I - Credit Hours: 3.00
- MA 26100 - Multivariate Calculus
- NUCL 20000 - Introduction to Nuclear Engineering ♦
- ME 27000 - Basic Mechanics I
- ME 20000 - Thermodynamics I

16 Credits

Spring 2nd Year

- NUCL 29800 - Sophomore Seminar
- MA 26600 - Ordinary Differential Equations
- NUCL 27300 - Mechanics Of Materials

- PHYS 24100 - Electricity And Optics
  or
- PHYS 27200 - Electric And Magnetic Interactions

- ME 27400 - Basic Mechanics II
- NUCL 20500 - Nuclear Engineering Undergraduate Laboratory I
- General Elective II - Credit Hours: 3.00

17-18 Credits

Fall 3rd Year

- NUCL 39800 - Junior Seminar
- NUCL 32500 - Nuclear Materials Laboratory
- NUCL 30000 - Nuclear Structure And Radiation Interactions

- NUCL 32000 - Introduction To Materials For Nuclear Applications
- NUCL 35000 - Nuclear Thermal-Hydraulics I
- MA 26500 - Linear Algebra
- General Elective III - Credit Hours: 3.00

18 Credits

Spring 3rd Year

- NUCL 39800 - Junior Seminar
- NUCL 31000 - Introduction To Neutron Physics
- NUCL 35100 - Nuclear Thermal-Hydraulics II
- NUCL 35500 - Nuclear Thermohydraulics Laboratory
- Math Elective (MA 300+) - Credit Hours: 3.00
- Technical Elective - Credit Hours: 3.00

15 Credits

Fall 4th Year

- Technical Elective - Credit Hours: 6.00
- NUCL 30500 - Nuclear Engineering Undergraduate Laboratory II
- NUCL 40200 - Engineering Of Nuclear Power Systems
- NUCL 44900 - Senior Design Proposal
- NUCL 49800 - Senior Seminar

- NUCL 51000 - Nuclear Reactor Theory I
  or
- NUCL 42001 - Radiation Interaction With Materials And Applications

15 Credits

Spring 4th Year

- ECE 20100 - Linear Circuit Analysis I
- NUCL 45000 - Design In Nuclear Engineering
- NUCL 49800 - Senior Seminar
- Technical Elective - Credit Hours: 6.00

- General Elective IV - Credit Hours: 3.00

15 Credits

Note

Students must have a graduation index of 2.0

Critical Course

The ♦ course is considered critical. A Critical Course is one that a student must be able to pass to persist and succeed in a particular major.

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Minor

Nuclear Engineering Minor

12 Credits Required

A minor in nuclear engineering is available to any student who completes a total of 12 credits, consisting of core courses NUCL 20000 and 30000 (each of 3 credits) plus an additional 6 credits in one area of specialization. Available areas of specialization include reactor physics, nuclear power systems, nuclear fusion, direct energy conversion, neural fuzzy approaches, reactor thermal-hydraulics, nuclear materials and radioactive waste management.

For more information, email the Nuclear Engineering Student Services Office.

Required Courses (6 credits)

- NUCL 20000 - Introduction to Nuclear Engineering
- NUCL 30000 - Nuclear Structure And Radiation Interactions

One group from the following (6 credits)

- NUCL 32000 - Introduction To Materials For Nuclear Applications
  and
- NUCL 42001 - Radiation Interaction With Materials And Applications
  OR
- NUCL 46000 - Introduction To Controlled Thermonuclear Fusion
  and
- NUCL 56000 - Introduction To Fusion Technology
  or
- NUCL 31000 - Introduction To Neutron Physics
  and
- NUCL 40200 - Engineering Of Nuclear Power Systems
  OR
- NUCL 20500 - Nuclear Engineering Undergraduate Laboratory I
  and
- NUCL 30500 - Nuclear Engineering Undergraduate Laboratory II
  and
- NUCL (Any additional course 2-3 credits)
  or
- NUCL (3 credits)
  and
- NUCL (3 credits) These are a combination of two upper division NE courses recommended by NE faculty.

Notes

Provided the above 12 credit hours are successfully completed with a grade of "C" or better in all of the courses, a NE Minor will be awarded.

All of the above perscribed minor courses must be taken at Purdue West Lafayette campus to be eligible for the NE Minor.

*Minimum Pre-requisities and/or Co-requisites include: MA 16500, MA 16600, MA 26100, MA 26200 (or MA 26500 + MA 26600); PHYS 17200, PHYS 24100 (or PHYS 26100 or PHYS 27200), or ENGR 16200.