UNIVERSITY OF MINNESOTA
Driven to Discover℠

Twin Cities Campus

Industrial and Systems Engineering B.I.Sy.E.

Industrial and Systems Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2018
- Required credits to graduate with this degree: 122
- Required credits within the major: 102
- Degree: Bachelor of Industrial and Systems Engineering

The industrial and systems engineering curriculum combines analytics (optimization, simulation, probability, and statistics) and management (project management, economics, marketing, and quality and reliability) to support the modeling, design, and optimization of systems across a wide range of applications and domains.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

Required prerequisites

Mathematics

MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II (4.0 cr)

Math 2374 and equivs

MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2573H - Honors Calculus III (4.0 cr)

Physical Sciences

Chemistry

CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
or CHEM 1071H - Honors Chemistry I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Introduction ISyE Courses

IE 1101 - Foundations of Industrial and Systems Engineering (4.0 cr)
IE 2021 - Engineering Economics (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Information current as of March 28, 2024

Program Requirements

All freshmen in the College of Science and Engineering must complete CSE 1001: First-Year Experience.

Non-ISyE Required Courses

CSCI 1133 - Introduction to Computing and Programming Concepts (4.0 cr)
ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2574H - Honors Calculus IV (4.0 cr)

ISyE Courses

IE 3521 - Statistics, Quality, and Reliability (4.0 cr)
IE 3011 - Optimization Models and Methods (4.0 cr)
IE 3553 - Simulation (4.0 cr)
IE 4011 - Stochastic Models (4.0 cr)
IE 3522 - Quality Engineering and Six Sigma (4.0 cr)
IE 4551 - Production, Inventory, and Service Operations (4.0 cr)
IE 5012 - Discrete Optimization Methods and Applications (4.0 cr)
IE 4511 - Human Factors (4.0 cr)
IE 4541W - Project Management [WI] (4.0 cr)
IE 4041W - Senior Design [WI] (4.0 cr)

Technical Electives

Complete 15 credits of technical electives to be approved by an ISyE faculty advisor.

Upper Division Writing Intensive within the major

Students are required to take one upper division writing intensive course within the major. If that requirement has not been satisfied within the core major requirements, students must choose one course from the following list. Some of these courses may also fulfill other major requirements.

Take 0 - 1 course(s) from the following:

- IE 4041W - Senior Design [WI] (4.0 cr)
- IE 4541W - Project Management [WI] (4.0 cr)