Industrial and Systems Engineering B.S.

Program Description

The Industrial and Systems Engineering program is a combination of Industrial Engineering and Systems Engineering. Industrial engineering is concerned with design, improvement and implementation of integrated processes of people, processes, information, materials, management and equipment. IE's draw upon specialized knowledge and skill in the mathematical, physical, and social sciences combined with the principles and methods of engineering analysis and design, to specify, predict, and evaluate processes and systems.

Systems engineering is an interdisciplinary and structured approach to designing and deploying successful systems to blend engineering, systems thinking, and management topics. Systems engineering deals with work-processes, optimization methods, and risk management tools while ensures that all likely aspects of a project or system are considered and integrated into a whole.

Students in this major have the opportunity to concentrate in either Industrial or Systems. Due to the relevance of the two disciplines, 75% of the curriculum is shared providing graduates with an expanded job market opportunities while the remaining 25% is directed towards the specifics of each area of engineering.

Upon graduation, students will be able to demonstrate:

- 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 teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- a 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.

 This program is a part of the Southern Polytechnic College of Engineering and Engineering Technology.

Accreditation

The Bachelor of Science in Industrial and Systems Engineering is accredited by the Engineering Accreditation Commission (EAC) of ABET, http://www.abet.org.

Admission, Enrollment, and Graduation Policies

Admission Requirements

This program does not have separate admission requirements and only admission to Kennesaw State University is required. For more information, please visit the Admissions section of the Catalog.

Enrollment Requirements

Upper division engineering courses require Engineering Standing.

Graduation Requirements

Each student is expected to meet the requirements outlined in Academic Policies 5.0 PROGRAM REQUIREMENTS & GRADUATION.

Program Course Requirements

Core IMPACTS Curriculum (42 Credit Hours)

General Education Core IMPACTS Curriculum

Core IMPACTS Curriculum Requirements Specific for This Major

Engineering Majors: Must take MATH 1190 in Mathematics & Quantitative Skills, MATH 2202 in Applied Math, and PHYS 2211/2211L & PHYS 2212/2212L in Natural Sciences.

Note: Students cannot take both PHYS 1111/L and PHYS 2211/L nor PHYS 1112/L and PHYS 2212/L.

Core Field of Study (18 Credit Hours)

Students must earn a grade of "C" or better in these courses.

- ENGR 1100: Survey of Engineering Applications from Mathematics
- ENGR 1000: Introduction to Engineering
- BIOL 1107: Principles of Biology I
- BIOL 1107L: Principles of Biology I Laboratory

  or

- CHEM 1212: Principles of Chemistry II
- CHEM 1212L: Principles of Chemistry Laboratory II
  or
- PHYS 2212: Principles of Physics II
- PHYS 2212L: Principles of Physics Laboratory II
- CSE 1321: Programming and Problem Solving I
- CSE 1321L: Programming and Problem Solving I Laboratory
- EDG 1210: Survey of Engineering Graphics
  One (1) credit hour carried over from Mathematics & Quantitative Skills.
  Two (2) credit hours carried over from Technology, Mathematics and Sciences.

Major Requirements (36 Credit Hours)

Students must earn a grade of "C" or better in these courses.

- TCOM 2010: Technical Writing
- MATH 3260: Linear Algebra I
- ENGR 3325: Engineering Economic Analysis
- ENGR 3250: Project Management for Engineers
- ENGR 4402: Engineering Ethics
- ISYE 1001L: Introduction to Industrial and Systems Engineering Lab
- ISYE 2600: Probability and Statistics I
- ISYE 3400: Deterministic Operations Research
- ISYE 3600: Probability and Statistics II
- ISYE 3150: Design & Improvement of Quality Processes
- ISYE 4200: Engineering Optimization: Stochastic Decision Models
- ISYE 4500: System Modeling & Simulation
- ISYE 4901: Senior Design Project I
- ISYE 4902: Senior Design Project II

Major Concentrations (25 Credit Hours)

Students must earn a grade of "C" or better in these courses.

Industrial Engineering Concentration

Required Courses (15 Credit Hours)

- ISYE 3125: Statistical Quality Control
- ISYE 3350: Logistics & Supply Chain Systems
- ISYE 3450: Work Measurement Study

- ISYE 4250: Manufacturing & Service Systems
- ISYE 4425: Facilities Planning & Material Handling

Elective Courses (10 Credit Hours)
Select 10 credit hours of 3000-4000 level coursework from the following prefixes: ISYE, CE, CPE, EE, ENGR, IS, ISA, MATH, ME, MTRE, SWE, or STAT.

Exclusions include: ENGR 3305, IS 3220, IS 3720, MATH 3272, STAT 3120, STAT 3125, or STAT 3130. Other technical courses will be considered with permission of the department chair. At most 4 hours can be applied to the degree from internship/cooperative study courses and at most 4 hours can be applied to the degree from directed study courses.

Systems Engineering Concentration
Required Courses (13 Credit Hours)

- EE 2305: Electronic Circuits and Machines
- ISYE 3100: Systems Reliability & Maintainability
- ISYE 3200: Human Machine Systems
- ISYE 3300: System Dynamics and System Thinking

Elective Courses (12 Credit Hours)
Select 12 credit hours of 3000-4000 level coursework from the following prefixes: ISYE, CE, CPE, EE, ENGR, IS, ISA, MATH, ME, MTRE, SWE, or STAT.

Exclusions include: ENGR 3305, IS 3220, IS 3720, MATH 3272, STAT 3120, STAT 3125, or STAT 3130. Other technical courses will be considered with permission of the department chair. At most 4 hours can be applied to the degree from internship/cooperative study courses and at most 4 hours can be applied to the degree from directed study courses.

Program Total (121 Credit Hours)