

Department of Industrial and Systems Engineering

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Industrial and systems engineering is the application of engineering methods and the principles of scientific management to the design, improvement, and installation of integrated systems of people, materials, information, equipment, and energy. The industrial and systems engineer is concerned with the design of total systems, and is the leader in the drive for increased productivity and quality improvement.

The industrial and systems engineering profession uses a variety of specialized knowledge and skills. These include communications, economics, mathematics, physical and social sciences, together with the methods of engineering analysis and design.

The industrial and systems engineer is often involved in designing or improving major systems that encompass the total organization. Consequently, he/she is often in contact with individuals from many segments of the organization. From his/her education and these experiences, the industrial and systems engineer develops a global view of the many inter-related operations necessary to deliver a firm's goods and services. Because of their management skills and global view of the organization, a large proportion of industrial and systems engineers move into management, and later advance into top management positions.

Although industrial and systems engineering is especially important to all segments of industry, it is also applied in other types of organizations, such as transportation, health care, public utilities, agriculture, defense, government, merchandising, distribution, logistics, and other service sectors. With increasing emphasis on quality and productivity for successful international competition, it is expected that industrial and systems engineers will be in increasing demand in the coming decades.

The objectives of the Department of Industrial and Systems Engineering are founded in Mississippi State University's educational philosophy and in the industrial engineering profession. They were developed to satisfy the needs of the department's constituents: students, employers, alumni, faculty, and the industrial engineering profession.

The Industrial Engineering program objective is to graduate students having a broad education, with emphasis in industrial and systems engineering fundamentals and practices, which enables them to function effectively in systems involving people, materials, information, energy, and money.

The six educational objectives of the Bachelor of Science degree in industrial engineering are stated below.

1. The Department of Industrial and Systems Engineering strives to ready its graduates for a lifelong pursuit of learning.
2. The Department of Industrial and Systems Engineering expects its graduates to be well versed in industrial engineering theory, know how to apply that theory, and to be capable of functioning effectively in a broad range of organizations.
3. The Department of Industrial and Systems Engineering expects its graduates to master important professional skills, including communication, economics, physical and social science, mathematics and statistics.
4. The Department of Industrial and Systems Engineering expects its graduates to interact cooperatively in professional situations with individuals having different cultures, training, education, and interest.
5. The Department of Industrial and Systems Engineering expects its graduates to think independently, to critically examine ideas, and to make discerning professional judgments, whether intellectual, ethical, or aesthetic.
6. The Department of Industrial and Systems Engineering expects to graduate professionally mature, responsible, and informed citizens.

Because of the importance of systems design in the many facets of industrial and systems engineering, instruction of the principles and methods of design is integrated throughout the curriculum of industrial engineering, and culminates in a major design experience in the student's senior year.

The Industrial Engineering Program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

General Education Requirements

English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

Mathematics

See Major Core

Science

See Major Core

Humanities

See General Education courses 6

Fine Arts

See General Education courses 3

Social/Behavioral Sciences

PSY 1013 General Psychology 3

EC 2123 Principles of Microeconomics 3

Major Core**Math and Basic Science**

MA 1713 Calculus I 3

MA 1723 Calculus II 3

MA 2733 Calculus III 3

MA 2743 Calculus IV 3

MA 3113 Introduction to Linear Algebra 3

CH 1213 Chemistry I 3

CH 1211 Investigations in Chemistry I 1

CH 1223 Chemistry II 3

PH 2213 Physics I 3

PH 2223 Physics II 3

Math/Science Elective

Choose one of the following: 3

PH 2233 Physics III

MA 3253 Differential Equations I

Engineering Topics

ECE 3413 Introduction to Electronic Circuits 3

EM 2413 Engineering Mechanics I 3

IE 1911 Introduction to Industrial Engineering ¹ 1IE 3121 Industrial Ergonomics Laboratory ¹ 1IE 3123 Industrial Ergonomics ¹ 3IE 3323 Manufacturing Processes ¹ 3IE 3913 Engineering Economy I ¹ 3IE 4333 Production Control Systems I ¹ 3IE 4513 Engineering Administration ¹ 3IE 4543 Logistics Engineering ¹ 3IE 4613 Engineering Statistics I ¹ 3IE 4623 Engineering Statistics II ¹ 3IE 4653 Industrial Quality Control ¹ 3IE 4733 Linear Programming ¹ 3IE 4753 Systems Engineering and Analysis ¹ 3IE 4773 Systems Simulation I ¹ 3IE 4915 Design of Industrial Systems ¹ 5IE 4934 Information Systems for Industrial Engineering ¹ 4

ACC 2203 Survey of Accounting 3

EG 1142 Engineering Graphics 2

IE Design Elective ² 3Engineering Science Elective ³ 6Materials Elective ⁴ 3**Oral Communication Requirement**

CO 1003 Fundamentals of Public Speaking 3

Writing Requirement

GE 3513 Technical Writing 3

Computer Literacy

Fulfilled in Engineering Topics courses

Total Hours 128

- ¹ A grade of C or better must be made in the course.
- ² Any three-hour industrial engineering course not required in curriculum.
- ³ Courses that can be used for the Engineering Science Elective are EM 2433, EM 3213, EM 3313, ECE 3424, and ME 3513.
- ⁴ Courses that can be used for the Materials Elective are CHE 3413 and ME 3403.

Industrial engineering is an academic discipline with applicability to a broad range of students from other majors. Engineering majors specifically may wish to complement their degree programs with a minor in industrial engineering to demonstrate knowledge and competence in industrial engineering areas. Completion of the minor requirements should prepare students to apply fundamental principles of industrial engineering, such as production control, operations improvement, and engineering management, to their chosen career field.

Only students with the Bagley College of Engineering are eligible for a minor in industrial engineering. Students majoring in industrial engineering are not eligible.

A minor in industrial engineering consists of three required courses for all student pursuing the minor and two restricted elective courses.

Required Courses

IE 3913	Engineering Economy I	3
IE 4613	Engineering Statistics I	3
IE 4333	Production Control Systems I	3

Students will select two of the following:

IE 3123 & IE 3121	Industrial Ergonomics and Industrial Ergonomics Laboratory	4
IE 4113	Human Factors Engineering	3
IE 4173	Occupational Safety Engineering	3
IE 4513	Engineering Administration	3
IE 4533	Project Management	3
IE 4543	Logistics Engineering	3
IE 4553	Engineering Law and Ethics	3
IE 4573	Process Improvement Engineering	3
IE 4653	Industrial Quality Control	3
IE 4733	Linear Programming	3
IE 4753	Systems Engineering and Analysis	3

Total Hours 15-16