

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 positions, 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
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Fine Arts

See General Education courses	3
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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
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PH 2233	Physics III	
MA 3253	Differential Equations I	
Engineering Topics		
CHE 3413	Engineering Materials	3
ECE 3183	Electrical Engineering Systems	3
EM 2413	Engineering Mechanics I	3
IE 1911	Introduction to Industrial Engineering ¹	1
IE 3121	Industrial Ergonomics Laboratory ¹	1
IE 3123	Industrial Ergonomics ¹	3
IE 3323	Manufacturing Processes ¹	3
IE 3913	Engineering Economy I ¹	3
IE 4333	Production Control Systems I ¹	3
IE 4513	Engineering Administration ¹	3
IE 4543	Logistics Engineering ¹	3
IE 4613	Engineering Statistics I ¹	3
IE 4623	Engineering Statistics II ¹	3
IE 4653	Industrial Quality Control ¹	3
IE 4733	Linear Programming ¹	3
IE 4753	Systems Engineering and Analysis ¹	3
IE 4773	Systems Simulation I ¹	3
IE 4915	Design of Industrial Systems ¹	5
IE 4934	Information Systems for Industrial Engineering ¹	4
ACC 2203	Survey of Accounting	3
EG 1142	Engineering Graphics	2
IE Design Elective ²		3
Engineering Science Elective ³		6
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 3283 and ME 3533.