

Industrial Engineering (IE) B.S.

The Institute of Industrial and Systems Engineers (IISE) defines Industrial Engineering as:

Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment, and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

Industrial Engineering is emerging as one of the vital professions that can be counted on for solving complex problems in a highly technological world.

Industrial engineers are confronted with a host of challenging situations ranging from manufacturing and cost estimating to the design of complex systems. They are needed in all kinds of industries and are employed by a variety of organizations including hospitals, banks, engineering firms, petrochemical industries, airline companies, government and military agencies, computer and software firms, and manufacturing.

Industrial Engineering at Texas A&M University-Commerce emphasizes the application of concepts, principles, and managerial skills required in contemporary business and industry. The program of study:

- reflects current and future business and industry practices and competencies
- prepares students for the high-tech engineering world of today and of the future
- develops analytical, critical, and problem-solving skills
- develops leadership skills
- promotes student and faculty interaction with business, industry, and professional organizations
- promotes student and faculty research activities

Graduates of the Bachelor of Science in Industrial Engineering program at Texas A&M University-Commerce will...

- Function effectively within an engineering profession or graduate program by drawing upon IE skills and knowledge, as evidenced by, but not limited to, continuous employment or successful progress towards a graduate degree.
- Progress within the engineering profession as evidenced by, but not limited to leaderships roles, value added within a team, increased responsibility with decision making, or creation of better or more effective products, processes, technologies, or ideas.
- Engage in life-long growth within the industrial engineering profession as evidenced by, but not limited to, company training, industry certifications, professional conferences, and graduate work.

IE Student Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

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

Core Curriculum Courses

See the Core Curriculum Requirements (<https://coursecatalog.tamuc.edu/undergrad/core-curriculum-requirements/>)

42

Required courses in the major

| | | |
|-----------|--|---|
| ENGR 110 | Introduction to Engineering and Technology | 3 |
| ENGR 1304 | Computer-Aided Design (CAD) | 3 |
| ENGR 113 | Product Design and Development | 3 |
| ENGR 2304 | Computing for Engineers | 3 |
| ENGR 2308 | Engineering Economic Analysis | 3 |

| | | |
|---------------------------------|---|------------|
| ENGR 2303 | Engineering Mechanics- Statics and Dynamics | 3 |
| ENGR 213 | Engineering Probability and Statistics | 3 |
| ENGR 411 | Engineering Management | 3 |
| IE 305 | Facilities Planning & Management | 3 |
| IE 311 | Advanced Engineering Statistics | 3 |
| IE 312 | Industrial Operations Research | 3 |
| IE 313 | Industrial Operations Research II | 3 |
| IE 314 | Statistical Quality Control | 3 |
| IE 318 | Analysis of Production Systems | 3 |
| IE 403 | Human Factors Engineering | 3 |
| IE 409 | Work Design | 3 |
| IE 410 | Systems Simulation | 3 |
| IE 431 | Manufacturing Support Systems | 3 |
| IE 444 | Systems Engineering | 3 |
| IE 471 | Planning for Industrial System Design | 3 |
| IE 486 | Service Systems Analysis | 3 |
| IE 495 | Industrial Systems Design | 3 |
| Required support courses | | |
| CHEM 1311 | General and Quantitative Chemistry I * | |
| CHEM 1111 | General and Quantitative Chemistry Laboratory I * | |
| COSC 1436 | Introduction to Computer Science and Programming | 4 |
| MATH 2413 | Calculus I (4 sch) * | |
| MATH 2414 | Calculus II | 4 |
| MATH 2320 | Differential Equations | 3 |
| MATH 2318 | Linear Algebra | 3 |
| ECO 2301 or ECO 2302 | Prin Macro Economics (3 sch) * Principles of Micro Economics | |
| PHYS 2425 | University Physics I (4 sch) * | |
| PHYS 2426 | University Physics II (4 sch) * | 4 |
| Total Hours | | 126 |

* These courses should be used to satisfy the Core Curriculum Requirements in Social and Behavioral Science, Natural Sciences, and Mathematics, respectively; otherwise, the credit hours required to earn the B.S. in IE will exceed 127.

A grade of "C" or higher must be earned in all courses in this Major.

Freshman

| Fall | Hours | |
|------------------------|-------|-----------|
| ENG 1301 | | 3 |
| Component Area | | 3 |
| MATH 2413 | | 4 |
| ENGR 110 | | 3 |
| ENGR 1304 | | 3 |
| Total Hours: 16 | | 16 |

Freshman

| Spring | Hours | |
|-------------|-------|---|
| ENG 1302 * | | 3 |
| HIST 1301 * | | 3 |
| PHYS 2425 * | | 4 |
| MATH 2414 | | 4 |

| | |
|----------|-----------|
| ENGR 113 | 3 |
| | 17 |

Total Hours: 17**Sophomore**

| Fall | Hours |
|-------------|--------------|
| HIST 1302* | 3 |
| COSC 1436 | 4 |
| MATH 2320 | 3 |
| ENGR 2303 | 3 |
| ENGR 2304 | 3 |
| | 16 |

Total Hours: 16**Sophomore**

| Spring | Hours |
|---------------|--------------|
| PSCI 2305* | 3 |
| MATH 2318 | 3 |
| PHYS 2426 | 4 |
| ENGR 213 | 3 |
| ENGR 2308 | 3 |
| | 16 |

Total Hours: 16**Junior**

| Fall | Hours |
|-------------|--------------|
| CHEM 1311* | 3 |
| CHEM 1111* | 1 |
| PSCI 2306* | 3 |
| ECO 2302* | 3 |
| IE 311 | 3 |
| IE 312 | 3 |
| | 16 |

Total Hours: 16**Junior**

| Spring | Hours |
|---------------|--------------|
| IE 305 | 3 |
| IE 313 | 3 |
| IE 314 | 3 |
| IE 318 | 3 |
| IE 410 | 3 |
| | 15 |

Total Hours: 15**Senior**

| Fall | Hours |
|-------------|--------------|
| ENGR 411 | 3 |
| IE 403 | 3 |
| IE 409 | 3 |
| IE 431 | 3 |

| | |
|------------------------|-----------|
| IE 471 | 3 |
| Total Hours: 15 | 15 |

**Senior
Spring**

| | Hours |
|--------------------------------|-----------|
| Creative Arts* | 3 |
| Language, Philosophy & Culture | 3 |
| IE 444 | 3 |
| IE 486 | 3 |
| IE 495 | 3 |
| Total Hours: 15 | 15 |

Total Hours: 15

First Year

| Fall | Hours | Spring | Hours |
|------------|-------|--------------------------|-----------|
| ENG 1301* | | 3 ENG 1302* | 3 |
| CHEM 1311* | | 3 Component Area Option* | 3 |
| CHEM 1111* | | 1 PHYS 2425* | 4 |
| MATH 2413* | | 4 MATH 2414 | 4 |
| ENGR 110 | | 3 ENGR 113 | 3 |
| ENGR 1304 | | 3 | |
| | | 17 | 17 |

Second Year

| Fall | Hours | Spring | Hours |
|------------|-------|------------------|-----------|
| HIST 1301* | | 3 HIST 1302* | 3 |
| PHYS 2426 | | 4 Creative Arts* | 3 |
| MATH 2320 | | 3 COSC 1436 | 4 |
| ENGR 2303 | | 3 MATH 2318 | 3 |
| ENGR 2304 | | 3 ENGR 213 | 3 |
| | | ENGR 2308 | 3 |
| | | 16 | 19 |

Third Year

| Fall | Hours | Spring | Hours |
|----------------------------------|-------|--------------|-----------|
| PSCI 2305* | | 3 PSCI 2306* | 3 |
| Language, Philosophy, & Culture* | | 3 IE 305 | 3 |
| IE 311 | | 3 IE 313 | 3 |
| IE 312 | | 3 IE 318 | 3 |
| IE 403 | | 3 IE 410 | 3 |
| | | 15 | 15 |

Fourth Year

| Fall | Hours | Spring | Hours |
|-----------|-------|-----------|-----------|
| ECO 2302* | | 3 IE 314 | 3 |
| ENGR 411 | | 3 IE 444 | 3 |
| IE 409 | | 3 IE 486 | 3 |
| IE 431 | | 3 IE 495 | 3 |
| IE 471 | | 3 | |
| | | 15 | 12 |

Total Hours: 126

* Courses can be satisfied by the Core Curriculum Requirements