

# 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
<b>Required support courses</b>		
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
<b>Total Hours</b>		<b>126</b>

\* 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
<b>Total Hours: 16</b>	

#### 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
<b>Total Hours: 15</b>	<b>15</b>

**Senior****Spring****Hours**

Creative Arts *	3
Language, Philosophy & Culture	3
IE 444	3
IE 486	3
IE 495	3
<b>Total Hours: 15</b>	<b>15</b>

**Total Hours: 15****First Year**

<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>
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	
		<b>17</b>	<b>17</b>

**Second Year**

<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>
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
		<b>16</b>	<b>19</b>

**Third Year**

<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>
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
		<b>15</b>	<b>15</b>

**Fourth Year**

<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>
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	
		<b>15</b>	<b>12</b>

**Total Hours: 126**

\* Courses can be satisfied by the Core Curriculum Requirements