

<i>Fifth Year</i>	
Fall Semester	Hrs.
CPE 481 <i>Senior Design Project</i>	3
GEC Elective	3
Free Elective***	3
Technical Elective	3
Technical Elective	3
Free Elective***	3
Total	18
Grand Total	159

*Only taught once per year, in the semester shown.

** Students may wish to schedule CS 110 and CS 111 in the first year and move the GEC electives to the later years.

*** Nine hours of any University scheduled course(s).

Technical Electives

Five technical electives are required. At least three must come from one of the electrical engineering emphasis areas other than computers. One additional technical elective must be a 400-level computer engineering course, and one technical elective may be selected from upper-division engineering, science, or math areas. However, a student with special career objectives can petition the department through his or her advisor for prior written permission to select one upper-division course meeting his or her career objectives.

Department of Industrial and Management Systems Engineering

Wafik Iskander, Ph.D., P.E., Chair
 321 Mineral and Energy Resources Building
 E-mail: wafik.iskander@mail.wvu.edu
<http://www.imse.cemr.wvu.edu>

Degree Offered

Bachelor of Science in Industrial Engineering

Industrial Engineering

Industrial engineering is the discipline of engineering concerned with the design, improvement, and installation of integrated systems of people, material, information, equipment, and energy to assure performance, reliability, maintainability, schedule adherence, and cost control. Industrial engineers look at the “big picture” of an operation or system and bridge the gap between management and operations. They deal with and motivate people as well as determine what tools should be used and how they should be used. Industrial engineers use computers and sophisticated software as tools to solve complicated problems to design, quantify, predict, and evaluate the performance of all types of complex technologies and systems.

The mission of the industrial engineering program at WVU is to advance the industrial engineering profession through innovative and high-quality academic programs, relevant research, and professional services that address the needs of West Virginia, the nation, and the world. The industrial and management system engineers at WVU are taught to draw upon specialized knowledge and skills 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. They are introduced to state-of-the-art software in their coursework for data analysis, information management, scheduling, quality control, optimization, and other practices and procedures used by the industrial engineering profession in highly evolving industries of the early 21st century.

The discipline of industrial engineering has a rich, ever-increasing diversity of applications. Traditionally, industrial engineers have been employed by manufacturing companies to do facilities and plant design, plant management, quality control, ergonomics, and production engineering. Today, however, industrial engineers are employed in almost any type of industry, business, or institution. Because of their skills, industrial engineers are more widely distributed and in greater demand among more industries than any other engineering discipline.

As an industrial engineer educated at WVU you can expect to have employment opportunities in manufacturing companies, insurance companies, banks, hospitals, technical sales, pharmaceutical companies, retail organizations including e-business, airlines, government agencies, consulting firms, construction, transportation, public utilities, social service, electronics, digital and wireless communications, etc. The diverse orientation of industrial engineering coupled with the skills and training you receive at WVU make you a prime source of management talent that offers unique professional advancement opportunities.

The industrial engineering program at WVU devotes considerable attention to the individual needs of the student. It is committed to develop student strengths in technical abilities, personal development, problem solving, and practical experience preparing them for careers in industry, business, government, or advanced professional degrees. One of the defining attributes in the success of the department is the dedication and talent of its faculty and staff. The aggregate careers of our faculty and staff represent nearly 300 years of service to students at WVU. In these 300 years of service are embodied the wisdom and experience to successfully prepare industrial engineers for the 21st century.

The faculty works extensively with our 200 sophomore, junior, and senior students in such areas as communication skills, personal growth and development, creation of summer internship opportunities, senior capstone project experience, and permanent job opportunities. As faculty and staff we are committed to provide for our students:

- A friendly, open-door collegial environment.
- Personable faculty mentoring students.
- Teaching concepts and techniques for today's demands.
- Quality courses that are innovative and challenging.
- Placement in the jobs they want.
- Notable lifelong successes.

As a graduate of the industrial engineering baccalaureate program at WVU, you will be prepared to:

- Practice industrial engineering and initiate and develop leadership roles in business, industry, and/or government.
- Continue professional development and life-long learning and contribute to the advancement of the industrial engineering profession.
- Interact in society and business in a professional, ethical manner and embrace diversity.
- Be proficient in written and oral communication and utilize people-oriented skills in individual and team environments.
- Apply the skills from industrial engineering to be proficient in your chosen field or graduate studies.

To be eligible for graduation with a bachelor of science in industrial engineering a student must attain a grade point average of 2.0 or better for all industrial and management systems engineering courses attempted. If a course is repeated, only the last grade received is counted in computing the grade point average, and the course credit hours are counted only once. This requirement assures that the student has demonstrated overall competence in the chosen major.

To complete the B.S. degree program in four years, a student must take approximately 17 credit hours per semester. A typical program that completes B.S. degree requirements in four years is as follows.

Industrial and Management Systems Engineering

First Year

Common first year as listed on the *middle* of page 103.

Second Year

Fall Semester	Hrs.	Spring Semester	Hrs.
MATH 251 <i>Multivariable Calculus</i>	4	MATH 261 <i>Elem. Differential Equat...</i>	4
CHEM 116 or PHYS 112	4	MAE 243 <i>Mech. of Materials</i>	3
MAE 241 <i>Statics</i>	3	IENG 213 <i>Engineering Statistics</i>	3
ENGL 102 <i>Comp. & Rhetoric</i>	3	IENG 377 <i>Engineering Economy</i>	3
IENG 200 <i>Fundamentals of IE</i>	1	GEC Elective	3
IENG 220 <i>Re-Engineering</i>	3	Total	16
Total	18		

Third Year

Fall Semester	Hrs.	Spring Semester	Hrs.
ECON 201 <i>Microeconomics</i>	3	ECON 202 <i>Macroeconomics</i>	3
IENG 304 <i>Materials and Costing</i>	3	IENG 302 <i>Mfg. Processes</i>	2
IENG 314 <i>Adv. Analy. Eng. Data</i>	3	IENG 303 <i>Mfg. Processes Lab</i>	1
IENG 350 <i>Intro. Oper. Research</i>	3	IENG 316 <i>Ind. Quality Cont.</i>	3
IENG 360 <i>Human Factors Engr.</i>	3	IENG 331 <i>Computer Appl. IE</i>	3
Total	15	IENG 343 <i>Prod. Plan & Design</i>	3
		Total	15

Fourth Year

Fall Semester	Hrs.	Spring Semester	Hrs.
EE 221 <i>Basic Electric Eng.</i>	3	IENG 472 <i>Design Prod. Systems</i>	3
EE 222 <i>Basic Electric Lab</i>	1	IENG <i>Technical Elective</i>	3
IENG <i>Technical Elective</i>	3	IENG 446 <i>Plant Layout/Mat'l Hand.</i> ..	3
IENG 455 <i>Simula. Digital Meth.</i>	3	Select 2 of the following courses.....	6
IENG 471 <i>Design Productive Sys.</i>	3	IENG <i>Technical Elective</i>	
GEC Elective	3	MAE 242 <i>Dynamics</i>	
Total	16	MAE 320 <i>Thermodynamics</i>	
		MAE 331 <i>Fluid Mechanics</i>	
		Total	15
		Grand Total	129

Department of Mechanical and Aerospace Engineering

Ever Barbero, Ph.D., Chairperson
323 Engineering Sciences Building
E-mail: ever.barbero@mail.wvu.edu
www.mae.cemr.wvu.edu

Degrees Offered

Bachelor of Science in Mechanical Engineering
Bachelor of Science in Aerospace Engineering

Aerospace Engineering

Aerospace travel, space exploration, and flight of manned or unmanned vehicles continue to gain significance. Aerospace engineering is involved with the science and technology of advanced vehicles, including aircraft, rockets, missiles, and spacecraft. Although a specialized branch of engineering, it is also diverse. Aerospace technology has expanded to include design and development of new earthbound vehicles such as ground-effect machines, hydrofoil ships, and high-speed rail-type systems.