College of Engineering
Industrial and Manufacturing Systems

Overview
Industrial engineers design and improve the way goods and services are produced and delivered. Using mathematics, science and engineering skills, they increase individual and system productivity, improve product quality and design safe work places. Industrial engineers work to eliminate waste of time, money, materials and other resources. Most importantly, industrial engineers are responsible for improving the overall effectiveness of an organization.

Professional options
Careers
Industrial engineers are in high demand across the U.S. and the world. They are found in nearly all industries — particularly manufacturing, service, health care, energy, transportation and financial organizations. Our graduates work as quality engineers, operations research analysts, operations management associates, process engineers and management consultants.

The average annual starting salary for our graduates is more than $60,000. Because of their ability to see systemwide problems and develop creative solutions, our graduates often move quickly into management positions.

Employers
Companies that have recently recruited our graduates include Deloitte Consulting, Exxon Mobile, Cessna, J.B. Hunt, General Mills, Blue Cross Blue Shield, PepsiCo/Frito-Lay and Spirit AeroSystems. A sampling of what some of our recent graduates are doing includes:
- Manufacturing and engineering associate for one of the world's largest food manufacturers.
- Facilities planning and ergonomic studies for a major aircraft manufacturing company.

Job Experience
Internships and co-ops are important ways students gain the necessary experience to enter the workforce ready to contribute and succeed. In addition to valuable work skills, these opportunities help students determine their career paths and may lead to full-time employment. More than 80 percent of our students complete at least one internship prior to graduation.

Alumni
Our department has an active alumni base that is interested in the success of the department and its graduates. Many of our graduates have reached the top of their profession, becoming executive officers of top corporations, multi-star generals, members of the National Academy of Engineering, and leaders of major universities.

Academics
The industrial engineering curriculum is based on a strong background in mathematics and science. The first two academic years are used to build the knowledge and experience base necessary to learn and apply fundamental engineering concepts and principles. Courses within the major are a blend of engineering and business topics.

Our courses are taught almost exclusively by our engineering faculty. The typical class size is fewer than 40 students.

We emphasize teamwork and group projects, which help students develop the tools for success in today's work environment. Our Senior Design course gives students the opportunity to work on a real-world problem for an organization. In Manufacturing Systems Design and Analysis, students gain experience in product design, production, marketing, sales and distribution.

Students have 15 hours of professional and industrial engineering electives that enable them to focus their education in areas of interest. Additionally, high-performing students can earn their bachelor's and master's degree concurrently, which takes about one year beyond the time it takes to complete the bachelor's degree alone.

Each industrial engineering student is assigned a faculty advisor to help with course selection, enrollment and career planning.

Accreditation
The program is accredited by the Engineering Accreditation Commission of ABET, abet.org.

Preparation
High school students interested in industrial engineering should take a college preparatory program. Though not required for entrance, high school courses in chemistry and physics are highly recommended. English and speech courses are important because effective communication is essential to an engineer. Mathematics preparation should include two units of algebra, one unit of geometry, one-half unit of trigonometry and calculus, if available. Check with your high school counselor for information.

Those who have not completed these math courses will be permitted to take makeup courses. Advanced placement is possible in subjects such as chemistry, mathematics and speech.

Activities
Clubs
The department has active student chapters of the Institute of Industrial Engineers, or IIE, and the Society of Manufacturing Engineers, or SME. Each group hosts a number of activities, including workshops, regional and national conferences, open house displays, picnics and intramurals.

K-State's IIE chapter has received the Gold Award in the national chapter recognition competition for six consecutive years. SME regularly tours manufacturing facilities and takes an annual trip to a major manufacturing exhibition in Chicago. Many students are involved in college and universitywide organizations such as Steel Ring, Engineering Ambassadors and the Student Governing Association.

Study abroad
Each year a number of our students choose to study abroad. For many, this is one of the most rewarding experiences in their college career. Recent IE students have traveled to the Czech Republic, Turkey and Australia. Similarly, many students participate in alternative spring break or faculty-led trips abroad.

k-state.edu/admissions/academics
Admission

Admission is selective based on academic performance. Submit application, application fee, all transcripts and ACT or SAT scores postmarked by the priority Feb. 1 deadline. Transfer students will be considered for all terms. Freshmen will be considered only for summer and fall terms.

Financial assistance

The priority deadline for incoming freshmen to submit the K-State scholarship application is Nov. 1, or Feb. 1 for transfer students. Students should submit their Free Application for Federal Student Aid by March 1. For additional details, visit k-state.edu/sfa.

Future students are encouraged to visit the K-State campus and the department. During your visit, we'll arrange for a faculty member to be available to answer your questions about the department, the classes you'd be taking and the profession. To set up an appointment, visit k-state.edu/admissions.

Suggested coursework

Bachelor of Science in industrial engineering

127 hours

Freshman

Hrs. Fall semester
4 MATH 220 Analytic Geometry and Calculus I
4 CHM 210 Chemistry I
3 ENGL 100 Expository Writing
3 IMSE 201 Introduction to Industrial Engineering
3 Humanities or social science elective
0 IMSE 015 Engineering Assembly
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Hrs. Spring semester
2 IMSE 250 Introduction to Manufacturing Processes
1 IMSE 251 Introduction to Manufacturing Processes Lab
4 MATH 221 Analytic Geometry and Calculus II
3 ECON 120 Principles of Microeconomics
2 ME 212 Engineering Graphics
3 ACCTG 231 Accounting for Business Operations
2 COMM 105 Public Speaking 1A
0 IMSE 015 Engineering Assembly
17

Sophomore

Hrs. Fall semester
4 MATH 222 Analytic Geometry and Calculus III
3 STAT 510 Introduction to Probability and Statistics I
5 PHYS 213 Engineering Physics I
0 IMSE 015 Engineering Assembly
3 Humanities or social science elective
15

Hrs. Spring semester
3 MATH 551 Applied Matrix Theory
3 STAT 511 Introduction to Probability and Statistics II
5 PHYS 214 Engineering Physics II
2 IMSE 530 Engineering Economic Analysis
1 IMSE 532 Industrial Project Evaluation
0 IMSE 015 Engineering Assembly
3 Humanities or social science elective
17

Junior

Hrs. Fall semester
3 IMSE 560 Operations Research I
3 IMSE 541 Statistical Quality Control
3 MANGT 420 Management Concepts
0 IMSE 015 Engineering Assembly
3 Computer programming elective
3 Engineering elective
15

Hrs. Spring semester
3 IMSE 660 Operations Research II
3 ENGL 415 Written Communication for Engineers
0 IMSE 050 Industrial Plant Studies
0 IMSE 015 Engineering Assembly
3 IMSE elective
3 Professional elective
3 Engineering elective
15

Senior

Hrs. Fall semester
3 IMSE 623 Industrial Ergonomics
3 IMSE 633 Production Planning and Inventory Control
3 IMSE 643 Industrial Simulation
0 IMSE 015 Engineering Assembly
3 IMSE elective
3 Professional elective
3 Engineering elective
15

Hrs. Spring semester
4 IMSE 580 Manufacturing System Design and Analysis
3 IMSE 685 Manufacturing Information Systems
3 IMSE 555 Industrial Facility Layout and Design
0 IMSE 015 Engineering Assembly
3 IMSE elective
3 Professional elective
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Curriculum notes

Computer programming elective: The computer programming elective consists of 3 credit hours taken from CIS 200, CIS 209 or ME 400.

Engineering electives: The 9 credit hours of basic engineering credit may not include more than 6 hours from a single department, and the 9 hours must be selected from the following courses. Note, students planning to take the Fundamentals of Engineering exam will be advised to take their 9 hours from classes with an "E" or "ME" designation.

Professional Electives: The 9 credit hours of professional electives are designed so that the student may specialize in an area of interest. Any of the following classes may count toward the professional elective requirement. Any IMSE class: any engineering physics, chemistry, biochemistry, biology, geology, kinesiology above 300; any CIS class above 200; MATH 240 and any mathematics class above 500 except MATH 570 and 591; any statistics class above 500 except STAT 702, 703, 706 and 710; BIO 198, 201; CHEM 230; FINAN 450, 510, 520, 643; ACCTG 241, 331, 342, 433; ECON 510, 520, 530, 540.

Electives: The electives must be selected from the industrial and manufacturing systems department. Each class must also be at least 3 credit hours.

Substitutions: IMSE 501 can substitute for MANGT 420; IMSE 591 and IMSE 592 can substitute for IMSE 580. Concurrent or prerequisite requirements for IMSE 591 are 24 credit hours of IMSE 500-level and above courses.

K-State 8: The courses required for a Bachelor of Science degree in industrial engineering satisfy five of the K-State 8 areas. The student must fulfill the aesthetic, global perspectives and historical perspectives tags. Most students will fill these with humanities, social science or professional electives.

Assembly requirement: Each semester a student must enroll in IMSE 015 unless he or she is a concurrent B.S./M.S. student, in which case a student must enroll in either IMSE 015 or IMSE 892.

1 Prerequisite for ENGL 415 is a B or better in ENGL 100. ENGL 200 must be taken if ENGL 100 grade was a C or lower.

For more information about industrial and manufacturing systems engineering, contact:
Department of Industrial and Manufacturing Systems Engineering
2061 Rathbone Hall
1701 B Platt St
Manhattan, KS 66506
785-532-6560
imse@k-state.edu
imse.k-state.edu

For more information about engineering, contact:
Office of Recruitment
1141 Engineering Hall
1701D Platt St.
Manhattan, KS 66506-0102
785-532-5455
kstateengg@k-state.edu
engg.k-state.edu

Post-Graduation Statistics
k-state.edu/postgrad-stats
ksdegreestats.org

K-State 8

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