

# INDUSTRIAL ENGINEERING

Industrial engineering is concerned with looking at the “big picture” of systems that allow organizations and individuals to perform at their best. Industrial engineers bridge the gap between management and operations. They deal with and motivate people, and decide what tools should be used and how they should be used. The focus of industrial engineering is on process improvement.

Because of their training, industrial engineers are employed in all types of industries, businesses, and corporations—from financial institutions to manufacturing plants to service providers to government agencies to health care systems. Industrial engineers help these organizations achieve increased productivity and quality in all operations.

WSU’s industrial engineering (IE) curriculum focuses on instruction and research in design, analysis, and operation of integrated systems of humans, materials, equipment, and money. The BS degree program requires the completion of 128 semester hours. Advanced placement credit may be applied toward completion.

You may select 12 hours of technical electives to emphasize your study of engineering systems, manufacturing engineering, or ergonomics/human factors. This allows you to specialize in an area of industrial engineering determined by your own interests and career plans.

Our faculty members are committed to your educational success. Class sizes are small, allowing individual attention for each student.

Many of the department faculty have won awards for excellence in research and teaching. Several are international experts in their concentrations.

Students in the WSU IE program have many opportunities to work on real problems in local companies as part of their course requirements. They also have the opportunity to participate in cooperative education, a voluntary program in which students gain real engineering work experience while going to school.

A testament to the IE program’s excellence is the record of success our students have had in regional and international technical paper competitions. WSU students have won the International IIE student technical paper competition more times in the last decade than any other program in the country.

## Admission

When you choose to major in industrial engineering, your industrial engineering faculty adviser will help you plan your course of study and will outline specific requirements for degree completion. It is important that you complete the basic skills classes, Calculus I, and University Physics I or General Chemistry I before the completion of 48 college hours.

## Laboratory and Computer Facilities

The industrial and manufacturing engineering (IME) department provides modern well-equipped laboratories to supplement classroom theory in

engineering computer graphics ergonomics/human factors, manufacturing engineering, and computer analysis.

College of Engineering students have access to computer laboratories equipped with microcomputers connected through a local area network and terminals connected to the University mainframe computer and the Internet.

## Related Opportunities

The IME department offers a wealth of opportunities for students to get involved on campus and in their chosen field. Students are encouraged to participate in the student chapters of professional societies including the Institute of Industrial Engineers (IIE), the Association for Operations Management (APICS), the American Society for Quality (ASQ), and the Society of Women Engineers (SWE). If you are eligible, you may join Alpha Pi Mu, the honorary society for industrial engineering, and Tau Beta Pi, the honor society for all areas of engineering.

## Related Programs

All of Wichita State’s engineering programs—aerospace, computer, electrical, industrial, manufacturing, and mechanical—share a math/science background and technical orientation. Graduate programs leading to master’s and doctoral degrees are offered in aerospace, electrical, industrial, and mechanical engineering, as well as a master’s program in engineering management.

## Faculty

- Michael J. Jorgensen (PhD, Ohio State University). Industrial ergonomics, work-related low-back disorders, musculoskeletal disorder epidemiology, intervention strategies, risk and exposure assessment methodology, and occupational safety.
- Krishna K. Krishnan (PhD, Virginia Tech). Facilities planning and material handling, virtual reality in manufacturing, CAD/CAM systems, free-form surfaces manufacturing, and design for manufacturability.
- Viswanathan Madhavan (PhD, Purdue University). FEA of manufacturing processes, strain rate and temperature measurement in machining, constitutive models, tribology of high speed sliding contacts, friction in sheet metal forming, use of virtual reality in the design of assembly lines, and engineering education.
- Don E. Malzahn (PhD, Oklahoma State University). Systems engineering, decision analysis, project management, and engineering education.
- Abu S. M. Masud (PhD, Kansas State University). Operations research, multi-criteria decision making, decision analysis and support systems, forecasting, and QFD.
- Michael Overcash (Ph.D., University of Minnesota). Manufacturing interfaces with sustainability improvements for products, corporations, and regional-to-global systems. Collaboration with faculty to add sustainability and life cycle thinking to broaden their research agenda. Life cycle information development for materials, product manufacturing processes, and transportation. Corporate sustainability program development.
- Janet Twomey (PhD, University of Pittsburgh). Intelligent data processing systems applied to manufacturing and service systems, and environmentally benign manufacturing.
- Gamal Weheba (PhD, University of Central Florida). Quality and reliability engineering, statistical process control, economics of quality, precision measurements, and rapid prototyping.
- Pingfeng Wang (Ph.D., University of Maryland, College Park). Reliability analysis and risk management, probabilistic analysis and design, maintainability, prognostics and health management.
- Larry Whitman (PhD, University of Texas at Arlington). Enterprise modeling and analysis, supply chain design, lean manufacturing, and production systems.
- M. Bayram Yildirim (PhD, University of Florida). Applied optimization, network optimization, supply chain management, scheduling, transportation planning, and pricing on congestible networks.

General Education Requirements	
Basic Skills (9 hours minimum) Must be completed in the first 48 college hours with a C or better	Minimum number of semester hours
<ul style="list-style-type: none"> <li>• College English Composition (English 100 or 101 and 102)</li> <li>• Public Speaking (Communication 111)</li> </ul>	6 3
Fine Arts, Humanities, and Social and Behavioral Sciences (18 hours minimum)	
<ul style="list-style-type: none"> <li>• One introductory course from a fine arts discipline</li> <li>• One introductory course from a humanities discipline</li> <li>• One introductory course from a social and behavioral sciences discipline</li> <li>• One introductory course from a second humanities discipline or a second social and behavioral sciences discipline</li> <li>• One further study course from one of the two disciplines in the division, humanities or social and behavioral sciences, in which two introductory courses are taken</li> <li>• Philosophy 385: Engineering Ethics</li> </ul>	3 3 3 3 3
Mathematics and Natural Sciences	
Calculus I, II, and III	13
Linear Algebra	3
University Physics I and II	8
General Chemistry I	5
Engineering Probability and Statistics I	3
Professional Course Requirements	
	Semester Hours
Engineering Graphics	3
Manufacturing Methods and Materials	3
Statics	3
Circuits I	4
Thermodynamics	3
Engineering Probability and Statistics II	3
Engineering Economy	3
Work Systems	3
Operations Research	3
Materials Engineering	3
Production Systems	3
Statistical Quality Control	3
Systems Simulation	3
Facilities Planning	2
Industrial Ergonomics	3
Information Systems	3
Visual Basic	3
Industrial Engineering Design	6
Technical electives	12
<b>General Education Course Requirements</b>	<b>59 Hours</b>
<b>Professional Course Requirements</b>	<b>69 Hours</b>
<b>Grand Total Hours for BSIE</b>	<b>128 Hours</b>

The University reserves the right to revise or change rules, charges, fees, schedules, courses, requirements for degrees, and any other regulations affecting students whenever considered necessary or desirable.

Notice of Nondiscrimination: Wichita State University does not discriminate on the basis of race, religion, color, national origin, gender, age, marital status, sexual orientation, status as a Vietnam-era veteran, or disability. Any person having inquiries concerning this may contact the Office of Equal Employment Opportunity, Wichita State University, 1845 Fairmount, Wichita, Kansas 67260-0145; telephone (316) 978-3001.