

# Industrial and Systems Engineering

## WHAT IS INDUSTRIAL AND SYSTEMS ENGINEERING?

Industrial and systems engineers design and improve processes to make work safer, faster, easier and more rewarding in service industries, entertainment companies, shipping and logistics businesses and healthcare organizations. Whether shortening a rollercoaster line, streamlining an operating room, distributing products worldwide or manufacturing superior automobiles, industrial and systems engineers face the challenge and common goal of saving money and increasing efficiency.

By using the right combinations of human and natural resources, fabricated structures, information technologies and manufactured equipment, industrial and systems engineers look at the big picture of what makes organizations work best.

## NOTABLE

- 437 undergraduate and 142 graduate students enrolled in fall 2015
- 12 full-time faculty members
- The Department of Industrial and Systems Engineering has been granting degrees since 1932
- Tim Cook '82 is CEO of Apple Inc.
- The department, along with the Department of Mechanical Engineering, offers a minor in automotive engineering and manufacturing systems that focuses on automotive design, manufacturing concepts, vehicle technology, factory floor control, Six Sigma and Lean Manufacturing
- Auburn's automotive manufacturing systems laboratory is the only manufacturing lab of its kind in the country, emulating an automotive assembly plant similar to manufacturers such as Toyota and Honda
- The department's Occupational Safety and Ergonomics and Injury Prevention programs are part of the Deep South Center for Occupational Health and Safety, a consortium of programs offering graduate education in occupational health nursing, industrial hygiene and occupational safety and ergonomics
- Sam Ginn '59, namesake of the College of Engineering, is a pioneer in the wireless communications industry and is a retired chairman and CEO of Vodafone AirTouch, PLC
- Students can earn a combined master's degree in industrial and systems engineering (MISE) and business administration (MBA) through the department and College of Business

## CURRICULUM

### Bachelor of Industrial and Systems Engineering

The industrial and systems engineering curriculum prepares students for professional practice through case studies, real-world projects and open-ended homework problems that develop students' engineering and design skills. A senior design capstone experience in an industrial or governmental organization brings the curricular education to an experiential close. Students study:

- systems analysis
- mathematical, physical and social sciences
- economic, technical and human performance considerations in design and analysis
- industrial and service systems
- stochastic and deterministic operations research
- engineering economy
- operations planning and manufacturing systems

For information about academic programs and minors, visit [www.eng.auburn.edu/programs](http://www.eng.auburn.edu/programs)

### Graduate curriculum

Along with three core classes, students choose from a wide variety of elective courses, including Six Sigma quality control, Lean Manufacturing, project management, real options and decision analysis, integer and non-linear programming, supply chain management, electronics manufacturing, adaptive optimization and human factors engineering. Graduate studies in the department have been ranked in the top 25 programs by *U.S. News and World Report*.

**Master of Science (M.S.)** — requires 30 credit hours, up to six of which can be thesis research (INSY 7990), plus a minimum of one hour seminar (INSY 7950/7956); graduate core courses contribute 9 hours; the thesis is supervised by an adviser and committee, and the final defense and examination is administered by this committee

**Master of Industrial and Systems Engineering (MISE)** — a 30 credit hour, non-thesis program that includes 9 hours of graduate core course work plus a one-semester-hour seminar

**Dual MBA/ MISE** — students obtain both an MISE degree and an MBA degree from Auburn in less than 2 years; the intervening summer is spent as an industrial intern or on an international experience; students must be admitted to both the MBA and MISE degree programs and may take either the GMAT or GRE exam

**Doctor of Philosophy (Ph.D.)** — requires a minimum of 60 credit hours plus a minimum one hour of seminar (INSY 7950/7956), including 9 credit hours from the graduate core curriculum; requires a research-based dissertation supervised by an adviser and committee; the proposal and final defense are administered by the committee

# RESEARCH, LABORATORIES AND CENTERS

The Department of Industrial and Systems Engineering provides opportunities to perform research in state-of-the-art laboratories through hands-on learning:

- Automotive manufacturing systems lab enhances learning in multiple courses with fully functional work cells; students build Lego cars to simulate factory workers and tweak the performance of the work cells as engineers
- Three occupational safety and ergonomics (OSE) labs encourage experiential learning and include the OSE Injury Prevention (IP) library, biomechanics lab and human factors engineering laboratory
- Electronics manufacturing lab located in Shelby Center and a larger lab in the Advanced Engineering Research Laboratories building
- Computer teaching lab and open student lab are located on the same floor as the department offices, making them convenient for students, faculty and staff

# TEAMS AND ORGANIZATIONS

Industrial and systems engineering students are encouraged to participate in campus organizations, teams and clubs, gaining experience with teamwork and project management beyond the classroom, including:

- Institute of Industrial Engineers (IIE)
- Alpha Pi Mu honor society
- American Society of Safety Engineers (ASSE)
- Human Factors and Ergonomics Society (HFES)
- Institute for Operations Research and the Management Sciences (INFORMS)

For more information, visit  
[www.eng.auburn.edu/organizations](http://www.eng.auburn.edu/organizations)

# LIFE AFTER GRADUATION

Industrial and systems engineers develop processes and systems that improve quality and productivity, eliminating excess time, money, materials and energy, and focus on a number of specialized areas, including:

- production and Lean Manufacturing
- occupational safety, ergonomics and human factors
- engineering management
- operations research, statistics and quality control
- systems design with routing, scheduling, linear programming, simulation and network flows
- data modeling, simulation, database design, decision support and supply chain

As companies and corporations across the globe increase their need for effective and efficient operations, their demand for highly skilled industrial and systems engineering professionals grows. According to the Bureau of Labor Standards, there will be a 13 percent increase in the demand for industrial engineers throughout the next 10 years.

Employers of recent Auburn ISE graduates include Apple, ExxonMobil, AT&T, Alabama Power, Intel, General Motors, Hyundai, UPS, Delta Airlines, Briggs & Stratton, ChevronTexaco, General Electric, Disney, Xerox, Accenture, Northrup Grumman, Boeing, Frito-Lay, BMW and branches of the United States military.

# SCHOLARSHIPS

The College of Engineering and the Department of Industrial and Systems Engineering provide scholarship opportunities to students at every stage of their academic career. To be eligible for scholarships at Auburn University, all students must apply through the AUSOM system. Freshmen must submit their applications before Feb. 10.

For information about engineering scholarships, visit  
[www.eng.auburn.edu/scholarships](http://www.eng.auburn.edu/scholarships)

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