

Undergraduate Program in **INDUSTRIAL AND SYSTEMS ENGINEERING**

Industrial Engineers Keep Thriving in the Changing Economy

As an IE, you may use your knowledge to:

- make corporations more globally competitive
- save the lives of patients in hospitals
- improve the effectiveness of our national security and military systems
- enhance productivity and quality in company operations

For over 100 years, industrial engineers have been the leader of changes in industry, helping reduce cost, improve product quality and enhance operational efficiency. Now that service industries have steadily increased their shares of the economy, industrial engineers are again leading the changes by providing engineering support to strategic, tactical and operational issues to not only the manufacturing industry, but a wide range of service industries, such as healthcare, transportation, banking, as well as education.

IEs save industries and businesses money and increase efficiency by eliminating waste of time, money, materials, energy, and other commodities. This is why many industrial engineers are promoted to management positions.

Industrial Engineers: Making Things Better, Safer, Faster

The need for industrial engineers is growing because industrial engineers are trained specifically to engineer processes and systems that improve quality and work productivity. IEs design a wide variety of systems that combine people, technology, information, materials, transportation, and energy to make goods or services. IEs solve problems in health care, aviation, defense, retail, transportation, entertainment, and finance, and in industries that manufacture everything from breakfast cereal to aircraft engines.

Facts About ISE@UB

- Full-time faculty: 18
- Average class size: 30
- Average starting salary: **\$62,200** (BS)

Degrees offered

- BS, MS, PhD
- A five-year BS IE + MBA degree
- Minor in Manufacturing



Curriculum Overview

[FRESHMAN-SOPHOMORE]

Freshman and sophomores take courses in science, mathematics, and engineering science, and required general education courses. The solid basis in problem solving and analytical thinking is essential for IE students. The curriculum is similar to other engineering majors, allowing flexibility when selecting the IE major. In the Spring semester, an optional one-credit course, IE 101, Discover IE, offers an overview of the IE profession.

[JUNIOR]

Juniors take courses in core IE topics to learn tools for modeling, improving, and designing systems – from computer interfaces, to hospital facilities, to transportation networks. Specific topics include probability and statistics, human factors and ergonomics, production planning, facilities design, and operations research.

[SENIOR]

Additional courses cover core IE topics, such as computer simulation and quality control. Students may take technical electives in advanced IE topics such as computer-integrated manufacturing, human-computer interaction, six sigma quality or lean manufacturing. Two technical electives may be chosen in other engineering, math, or science departments, or in related areas such as economics, psychology, or business. All IE seniors complete a lab course integrating and applying IE methods to design problems, and complete a faculty supervised internship at a local company where they gain real-world experience in IE practice.

Research Opportunities

Undergraduates have the opportunity to work with faculty on research addressing important societal needs, such as improving health care systems, making public transportation accessible to people with disabilities, and making our nations' transportation systems more energy efficient.

IE: Strong Opportunities

The demand for Industrial Engineers is strong in today's economy. The US Department of Labor's Bureau of Labor Statistics emphasizes how the versatility of Industrial Engineers means that their work is valuable for a range of industries, leading to a stable job outlook. Changes in how health care is delivered is also creating new demands for IEs. According to a recent Forbes Magazine article, job postings for Industrial Engineers have far exceeded hires, indicating strong needs for new IE talent.

Careers for UB IE Grads

Opportunities for industrial engineers exist in Western New York, nationally, and internationally. Our degree-holders work in a number of industry and government settings including: Baxter Health Systems, Boeing, Bose, California State Legislature, Cameron International, Covidien, Disney, Dresser-Rand, DuPont, General Electric, General Motors, Praxair, United Healthcare, and Wilson Greatbatch.

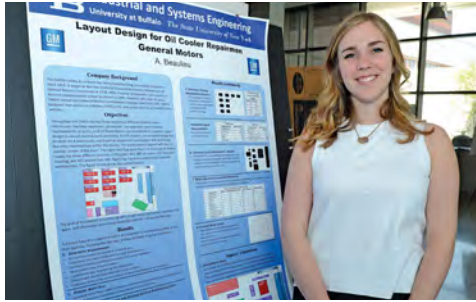
IE Students Are Involved

IE students at UB participate in a number of professional and student organizations, reflecting the wide range of student interests. Activities include academic competitions, conferences, field trips, and sponsored speakers. Below are some examples:

- National honors societies: Alpha Pi Mu, (IE); Omega Rho (operations research); Tau Beta Pi (engineering).
- UB student chapters and student memberships available in American Society of Quality (ASQ); Human Factors Society (HFS); Institute of Industrial and Systems Engineers (IISE); Institute of Operations Research and the Management Sciences (INFORMS); Society of Manufacturing Engineers (SME); The Society of Women Engineers (SWE).

"Being an active member of IIE has furthered my educational experience here at UB because of the great professional networking opportunities that are available. Aside from those, the social and service activities give us a great chance to get to know other IEs that might not be in your classes as well as to benefit the school in many ways."

—Dave Myers, ISE student



All IE Students Get Industry Experience

Internship projects are a required part of the ISE curriculum. All students gain experience with real world industrial engineering projects on site at local companies as part of our capstone design course, IE 494.

Internship projects have been sponsored by many companies including General Mills,

Cameron, General Motors, and Catholic Health Systems. In addition, IE students have access to engineering programs that link students with industry experience. The School's experiential learning programs encourage students to "engineer today" by becoming involved in activities outside the classroom, including job shadowing, intramurals, and internships, among others. The university also provides extensive engineering specific career counseling, technology employment fairs, and on-campus interviewing services which help IE students find paid internships and post-graduation employment.

Did You Know?

UB's ISE department ranked 20th out of all public ISE programs in the country, in *US News and World Reports'* survey of top national engineering schools.

Many students with BS IE degrees go on to pursue graduate studies in IE areas of production management, human factors, production systems, and operations research, or to pursue MBA degrees. Students have also gone on to receive advanced degrees in business, economics, information science, law, and other engineering fields.

IE graduates have a flexible degree that supports a number of different careers. In addition to large corporations, an IE graduate may work at a consulting firm where IE skills are applied across a range of industries. Many IEs move into management positions because they have a broad perspective on system design and improvement – in fact, many company CEOs have an IE background. IEs are even moving into politics where they can "re-engineer" government processes and services!

Award-Winning Faculty

ISE Associate Professor **Jun Zhuang** is a dedicated researcher, teacher, and mentor. His extensive work involving undergraduates in ongoing research has been recognized by UB's 2012 President Emeritus and Mrs. Martin Meyerson Award for Distinguished Teaching and Mentoring as well as the 2008 Graduate Student Mentor Award from the University of Wisconsin-Madison where he earned his PhD. Zhuang's research's applies operations research and game theory to improve preparations for, and responses to, natural disasters both in the US, and globally. In 2013, he received UB's Young Investigator Award in recognition of his research impact.



To apply, please visit admissions.buffalo.edu

Student Excellence



Shanney Lacey (BS IE '13) was a recipient of UB's Undergraduate Research Award for her contributions to research on electronic health records

implementation in primary care practices. She was also the recipient of the Watts Engineering and Architecture Minority Scholarship; and received the 2012 CSTEP (Collegiate Science & Technology Entry Program Student of the Year award, designed to acknowledge students who have shown dedication and support to the CSTEP program.

Successful Alumni



Lisa Scolnick (BS IE '90) a Six Sigma Lean Consultant at E.I. DuPont, has more than 21 years of process improvement and project management

experience. She has demonstrated the ability to significantly reduce costs, increase productivity and reduce lead times in a broad range of manufacturing and service organizations. In addition to the BSIE, Scolnick earned her Master of Business Administration (1997) from UB. She received her Lean Training through the Lean Enterprise Institute in Cambridge, MA. She is also a Certified Six Sigma Black Belt and Workplace Big Five Personality Profile consultant.

CONTACT INFO

Ann Bisantz
Professor and Chair
716.645.2768
bisantz@buffalo.edu

Jun Zhuang
Associate Professor and
Director of Undergraduate
Studies
716.645.4707
jzhuang@buffalo.edu