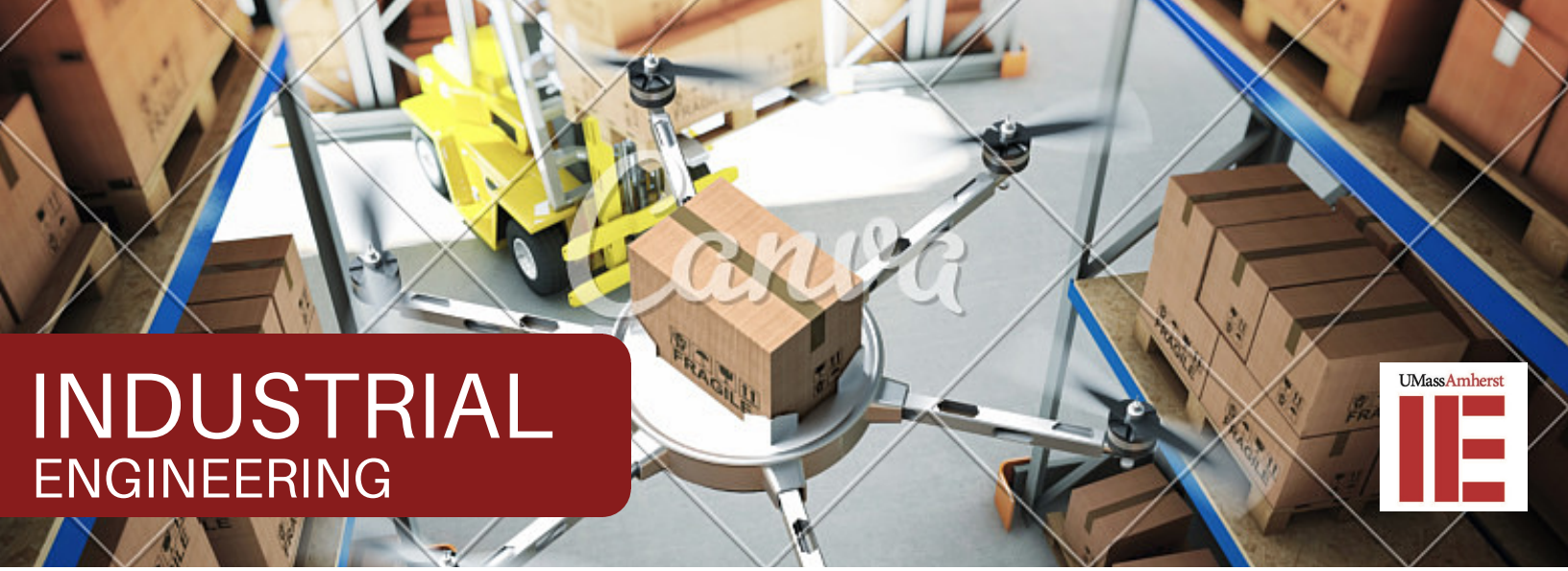

INDUSTRIAL ENGINEERING

UMassAmherst IE

Where math, engineering, economics, social science, computer science and business collide.

In the workplace, industrial engineers (IEs) provide a systematic approach to streamline, improve, and optimize productivity and efficiency. IEs are problem solvers, innovators, and decision makers. Their input impacts the items we use, and places we visit, every day. Industry looks to IEs to develop, advance, implement and evaluate solutions and systems that address complex real-world problems.

As an undergraduate IE major, you will also tackle operations research (OR) which involves using scientific methods to manage the allocation of material, money, technology, time and workers. The use of decision analysis, game theory, and simulation significantly ties OR to computer science. OR is such an important implement in an IEs toolset that we often refer to them together as IEOR.

Career Outlook

Looking at the Class of 2015, 83% of UMass Amherst IE undergrads found engineering jobs, or went to graduate school, within six months of graduation. This is a conservative number, as it counts non-responders as still looking. The average starting salary was $62,018.

An IE degree offers variety and opens the door into many industries, such as healthcare, entertainment, energy, food & consumer products, aerospace, defense, manufacturing, logistics, and business administration & management. Here are some examples of what IEs do-

- As a **management engineer** in a hospital, you may design procedures for optimal use of medical facilities to help bring the cost of healthcare down.
- As an **ergonomist** in a manufacturing plant, you may change the tools workers use to reduce the risk of repetitive stress injuries.
- As a **quality engineer** for a public gas and electric company, you may improve customer satisfaction by designing a process to schedule service calls around the availability of the customer.
- As a **financial engineer**, you may aim to determine precisely the financial risk that certain financial instruments create.
- As a **revenue manager**, you may optimize organizational revenue based on operational capacity and timing for different market segments or from different sources of funding.
- As an **analyst**, you may conduct real-time system monitoring to optimize operations

UMass Amherst IE Faculty

- **Erin Baker:** "IEs keep the lights on by making sure that electricity generation and use is balanced at every minute of the day; they also help work toward a more sustainable world by helping organizations increase energy efficiency."

- **Hari Balasubramanian:** ''IEs are ideally trained to tackle problems in many service sectors; they deal with complex airline and crew scheduling problems, enable FedEx to manage better its logistics, allow large retail stores manage their inventories, and help emergency rooms to reduce delays in patient care.'

- **Chaitra Gopalappa:** "IEs can help predict the spread of infectious disease, in time to prevent epidemics, saving lives and preventing economic strains on populations nationally and globally."

- **Jenna Marquard:** "IEs can reduce healthcare costs by ensuring that the computers and medical devices doctors and nurses use make patient care safe and efficient."

- **Ana Muriel:** ''IEs design the production and service processes that create value to any organization and society at large. Their objective is to ensure fast response and high quality, with minimum cost, waste, environmental impact, and risk.''

- **Bernd Schliemann:** "Some of the best students on this campus are IE majors – they address complex issues and have the aptitude for technical problem solving. They also enjoy interacting with people to best address productivity, inventory, forecasting, and quality in both service and manufacturing industries. If you seek a strong technical foundation, innovative solutions, and a varied and challenging career, IE could be the perfect major."

- **J. MacGregor Smith:** ''IEOR researchers use mathematical programming and stochastic processes to optimize flow processes in manufacturing and service systems.''

Core Classes

- Probability and Statistics
- Engineering Economy
- Facility Layout and Simulation Modeling
- Optimization & Stochastic Modeling
- Human Factors
- Quality Control
- Production Planning & Control

Sub-fields of IE

- Operations research/Operations management
- Systems engineering
- Management sciences
- Engineering management
- Decision sciences
- Information engineering
- Quality engineering
- Ergonomics engineering

Get in Touch

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IE INNOVATE. IMPROVE. INSPIRE.
UMassAmherst

Accreditation & Ranking

Industrial Engineering and Operations Research (IE/OR) is an accredited engineering degree program at the University of Massachusetts Amherst. It is ranked #36 in the country by U.S. News & World Report 2017 Engineering graduate program rankings.