Industrial Engineering & Management

Industrial engineering (IE) is an interdisciplinary profession focused on the optimization of complex systems (e.g., logistics), processes (e.g., manufacturing), or organizations. Industrial engineers develop and apply quantitative and data driven tools to help people and organizations make better decisions. Fundamentally, IE is an engineering approach to systems-based decision making, hence can be applied in virtually every sector (e.g., manufacturing, service, retail, technology, healthcare). Engineering management is a discipline that addresses the management of engineering projects. This includes leading the technical and economic aspects of a project to ensure that it is aligned with the organization's objectives, safely implemented, finished on time, and completed within the budget. Together, Industrial Engineering & Management (IEM) help companies make the best use of their resources and identify the most attractive opportunities.

Industry Applicability
Industrial Engineering & Management incorporates transferable skills that are highly applicable in numerous industries. Here are a few examples of the types of jobs that typically employ students specializing in IEM:

- Design, plan and operation of manufacturing and service systems (e.g., logistics, warehousing, delivery)
- Revenue management and pricing (e.g., in airlines, hospitality)
- Management consulting
- Data analytics in industries such as technology and finance
- Strategic management of large engineering projects (e.g., energy)

Many undergraduates who study IEM go on to earn an MS in Operations Research or Industrial Engineering, or an MBA.

Examples
Financial engineering: Financial companies have access to tremendous amounts of data about their customers. Using this information, they need to decide which products to offer (e.g., new credit cards, loans) so as to maximize profitability while managing risk.

Energy investment: Energy companies must spend significant amounts of capital in order to bring energy projects to the market. Energy prices are volatile and these investments are risky. These companies need help modeling their investment opportunities and making the right choice.

Public policy: Public policy decisions can have significant benefits and costs that involve complex tradeoffs. For example, a policy to impose a carbon tax may decrease the use of fossil fuels, thereby reducing potential climate damage, but will also impose a cost on consumers by making energy more expensive. IEM methods are used to model these decisions and help policymakers make the best choice.

Faculty Mentors:
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IEM students must take 4 courses from the lists below. At least 1 of these must be an ORI undergraduate course, and no more than 2 can be McCombs courses.

ORI Undergraduate Courses (select 1 to 4)

- M E 366L, Operations Research Models
- M E 367S, Simulation Modeling
- M E 373K, Basic Industrial Engineering
- M E 397M, Facility Planning and Logistics
- M E 375K, Production Engineering Management
- M E 377K, Projects in Mechanical Engineering

ORI Graduate Courses (select 0 to 3)
(may be taken with instructor approval)

- M E 397M, Statistical Methods in Manufacturing
- ORI 390Q.2 Production and Inventory Control
- ORI 390R.1, Applied Probability
- ORI 390R.17, Decision Analysis I
- ORI 390R.18, Decision Analysis II

McCombs Courses (select 0 to 2)
NOTE: no more than 2 courses from McCombs can be counted toward the ME CGE requirements

- FIN 320F, Foundations of Finance
- LEB 320F, Foundations of Business Law and Ethics
- MAN 320F, Foundations of Management & Organizational Behavior
- MKT 320F, Foundations of Marketing
- BA 320F, Foundations of Entrepreneurship
- IB 320F, Foundations of International Business

Organizations and Societies

INFORMS, Institute for Operations Research and Management Sciences, www.informs.org
IISE, Institute of Industrial and Systems Engineers, www.iise.org