Operations Research and Industrial Engineering

Master of Science in Engineering
Doctor of Philosophy

For More Information

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URL: https://www.me.utexas.edu/academics/graduate-program/areas-of-study/operations-research-and-industrial-engineering

Objectives

Operations research is a mathematical science concerned with optimal decision making and the modeling of deterministic and probabilistic systems. Its focus and field of application are interdisciplinary, embracing a broad range of quantitative techniques. Industrial engineering is concerned with the design, improvement, and installation of integrated systems of personnel, material, and equipment. Together, operations research and industrial engineering provide a rational approach to engineering and managerial problem solving through the deliberate application of scientific methods.

In practice, operations research and industrial engineering address both the performance objectives and the resource constraints of an organization, working toward the establishment of policies that are most beneficial to the organization as a whole. The function of the operations research analyst or the industrial engineer is to guide decision making by identifying underlying cause-and-effect relationships, developing and proposing courses of action, establishing criteria by which to judge their effectiveness, and evaluating their probable effects. The program in operations research and industrial engineering is designed to allow students to develop the technical, analytic, and managerial skills necessary to perform these tasks successfully.

The principal goals of the program are to provide the student with the educational basis for continued learning and to impart the fundamental skills necessary to be a successful analyst. Students are expected to develop proficiency in one or more programming languages, expertise in mathematical modeling, and an understanding of the uses and limitations of commercial optimization and statistical software. The master's degree program balances theory and applications. At the doctoral level, the program's emphasis on research is intended to enable students to extend their field of knowledge and to develop the analytic techniques that will serve them in academic, industrial, or governmental careers.

Areas of Study

The program in operations research and industrial engineering is designed to educate engineers who will solve complex industrial-socioeconomic problems by applying fundamental principles from engineering, mathematics, economics, computer science, and systems theory. In support of this end, a wide variety of research and study areas are offered by a faculty whose expertise covers such fields as optimization, simulation, statistics, stochastic processes, decision analysis, and manufacturing systems. The program is rigorous but sufficiently flexible to accommodate the needs and interests of most students.

Once students choose a study area, they work closely with one or more faculty members pursuing research in that area. Because of the interdisciplinary nature of the program, many projects involve teamwork and collaboration with departments in the Cockrell School of Engineering and the McCombs School of Business. Each student's program includes a balanced combination of coursework, seminars, computational analysis, and research. State-of-the-art computer facilities, specialized laboratories, and the latest versions of applications software are available to all graduate students.

Graduate Studies Committee

The following faculty members served on the Graduate Studies Committee (GSC) in the spring 2024 semester.

Jonathan F Bard
J Eric Bickel
Raghu Bollapragada
Stephen Boyles
Constantine Caramanis
Dragan Djurdjanovic
John J Hasenbein
Erhan Kutanoglu
Benjamin D Leibowicz
Lauren A Meyers
Evdokia Nikolova
Purnamrita Sarkar
Peter H Stone

Admission Requirements

The Admission Committee uses the following policies in considering applicants for admission. Each application is reviewed on its merits.

a. Applicants must provide a Graduate Record Examinations General Test (GRE) score no more than five years old. The applicant should have a grade point average in upper-division undergraduate coursework of at least 3.0 on a 4-point scale, or the equivalent. Students who feel that their GRE scores and grades do not reflect their ability to do high-quality graduate work should submit a statement explaining this belief.
b. Both the master's and the doctoral degree program are designed for full-time study, but part-time students are accepted. From the time of entry until completion, students are expected to show evidence of commitment to the program and of progress toward the degree.
c. As a general rule, students should enter the program in the fall semester, because of the way basic graduate courses are scheduled.
d. Students who do not have undergraduate degrees in engineering, mathematics, or the sciences may be required to remove deficiencies before beginning graduate coursework.