OVERVIEW STATEMENT

The faculty and staff in the department of engineering systems (DES) wishes to offer our warmest greetings and heart-felt welcome to everyone interested in our programs. These are very exciting times for DES with new courses and curricula, and the recent introduction of the Ph.D. program in systems engineering. All our programs address a practicing engineer’s concerns and industry needs at a global level.

The mission of the department of engineering systems is to prepare engineers and scientists for leadership roles in business organizations by providing them with the skills to expand their areas of responsibility in the workplace, and updating their skills within their fields of specialization.

M.S. Engineering Management (M.S.E.M.)

M.S.E.M. meets the professional needs of the engineer who, although working in a technical field, finds it necessary to update his or her skills in engineering, as well as acquire knowledge in the management of engineering. Typically, the technical person finds that as he or she advances in the chosen field, the challenges of management increase as part of the overall responsibilities of the position. Many find that their careers would best be served by a program addressing both areas of their job responsibilities. This interdisciplinary program is designed for those individuals. The program requires a minimum of 30 credit hours or 10 courses for graduation. Thesis option is also available.

M.S. Systems Engineering (M.S.S.E.)

Today, an engineer or scientist who joins the workforce in the public or private sector, especially in the high-tech realm, is faced with the challenge of integrating design and development work with the work of other inter-company or intra-company groups.

The Master of Science program in systems engineering meets the systems engineering and system integration needs of a student who has an undergraduate degree in engineering, physical science, computing or mathematics. It draws on expertise and experience in these multidisciplinary areas, preparing the engineering or science graduate in such key advanced subjects as modeling and analysis, systems engineering principles, research methods in systems engineering, and system life cycle cost estimation. This program requires a minimum of 30 credits or 10 courses for graduation. Thesis option is also available.

Ph.D. Systems Engineering (PhD-SE)

The Ph.D. program in systems engineering is designed to provide advanced education and research opportunities to qualified students with master’s degrees. On completion, the program prepares students to conduct independent scholarly work, teach in academia or pursue advanced research careers in government, commercial or private sectors.

The program is ideally suited to applicants with a master’s degree in systems engineering. If an applicant does not have a master’s degree in systems engineering, five master’s-level core courses (or equivalents as determined by the department) are required before beginning doctoral-level course work.
The Ph.D. in systems engineering requires a minimum of 48 semester credit hours beyond the master's degree including 24 semester credit hours of doctoral-level course work and 24 semester credit hours of dissertation research.

**RESEARCH**

1. Applied machine learning with a focus on geometric information exploitation in a variety of domains, such as signal processing, image and video analysis and text mining
2. Co-directorship of the Information Characterization and Exploitation (ICE) Lab
3. High-speed, high-resolution imaging through atmospheric turbulence; unconventional optical detection methods; image processing; smart sensing systems, image and signal processing, and applied systems engineering
4. Development of optimization models, simulation systems, performance analyses and expert decision support systems
5. Applications related to the fields of software engineering, healthcare operations and transportation
6. Combinatorial optimization using heuristics and other artificial intelligence techniques
7. Multi-attribute decision analysis
8. Game theoretical applications

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