Electrical & Systems Engineering

About Electrical & Systems Engineering

The mission of our undergraduate programs is to instill in students the knowledge and perspective — appropriate for both a professional career and the pursuit of advanced degrees — of fields that rely on key electrical engineering and systems principles and practices. Such principles and practices include rigorous quantitative reasoning and robust engineering design. This mission is accomplished by ensuring that students achieve both depth and breadth of knowledge in their studies and by maintaining a high degree of flexibility in the curriculum. Our programs also seek to provide good preparation for life, including the ability to communicate in written and oral forms and a desire to continue learning throughout life. In addition, these programs aim to provide the opportunity and training necessary for students to acquire the skills and attitudes to become leaders.

The department offers courses of study leading to degrees in both electrical engineering and systems science and engineering. Opportunities for study and research currently available in the department include semiconductor theory and devices, optoelectronics, nanophotonics, communication theory and systems, information theory, signal and image processing, tomographic imaging, linear and nonlinear dynamics and control, robotics, identification and estimation, multisensor fusion and navigation, computational mathematics, optimization, optimal control, autonomous systems, operations research and financial engineering. Students are encouraged to participate in research activities as soon as they have received training in the fundamentals appropriate for a given research area.

Electrical engineering is the profession for those intrigued with electrical phenomena and eager to contribute their skills to a society increasingly dependent on electricity and sophisticated electronic devices. It is a profession of broad scope, with many specialty careers designed for engineers who seek an endless diversity of career paths on the cutting edge of technology. The Institute of Electrical and Electronics Engineers publishes transactions on about 60 different topics, from aerospace and electronic systems to visualization and computer graphics. This is a breadth so great that no single electrical engineering department can hope to span it. Moreover, those fields themselves encompass still more fascinating specialties. We provide the opportunity and training necessary for students to acquire the skills and attitudes to become leaders.

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Students who seek a broad undergraduate education in electrical engineering or systems science and engineering but who plan on careers outside of engineering may pursue the applied science degrees: Bachelor of Science in Applied Science (Electrical Engineering) and Bachelor of Science in Applied Science (Systems Science & Engineering). These programs of study are appropriate for students planning to enter medical, law or business school and who desire a more technical undergraduate experience than what otherwise may be available to them.

The ESE department also offers a variety of educational opportunities for students enrolled in other departments. These include the second major in systems science and engineering and the second major in electrical engineering, which are open to students inside as well as outside of the McKelvey School of Engineering, such as the College of Arts & Sciences and Olin Business School. They also include the minor in quantum engineering, the minor in electrical engineering, the minor in energy engineering, the minor in mechatronics, the minor in robotics, and the minor in systems science & engineering.

**Bachelor's/Master's Programs in Electrical & Systems Engineering**

Students enrolled in any of the undergraduate degree programs in the McKelvey School of Engineering may choose to extend their educational experience by enrolling in a five-year Bachelor’s/Master’s program. The Master of Science in Electrical Engineering (MSEE), the Master of Science in Systems Science and Mathematics (MSSSM), and the Master of Science in Engineering Data Analytics and Statistics (MSEDAS) degrees are participating graduate degrees, and these may be combined with any undergraduate degree that provides the appropriate background.

General requirements for the Bachelor’s/Master’s programs include the residency and other applicable requirements of the university and the McKelvey School of Engineering, which are found elsewhere in this Bulletin. In summary, students must complete all the degree requirements for both the undergraduate and graduate degrees.

Phone: 314-935-5565
Website: https://ese.wustl.edu/academics/undergraduate-programs/index.html