Electrical & Systems Engineering

Admission Requirements

Admission to the Electrical Engineering and Systems Science & Mathematics Doctoral Programs are decided on an individual basis. Admission directly into the Department of Electrical & Systems Engineering doctoral programs upon completion of the undergraduate degree is available to students who have distinguished themselves in their undergraduate studies.

Strong applicants who are dedicated to completing a doctoral degree are encouraged to apply directly to a doctoral program. Students should apply upon completion of the MS degree and are generally required to have a 3.5 grade point average (85%) and endorsement from the graduate admissions committee.

The minimum requirement to be admitted to the Department of Electrical & Systems Engineering Master of Science in Electrical Engineering program is a 3.0 cumulative grade point average (or 80%) unless the applicant was a part-time student with work experience.

Admission to our Master of Science in Systems Science & Mathematics program is not dependent on a specific undergraduate grade point average, but is based on proof of strength in mathematics courses.

Prospective graduate students should apply online and follow the checklist below to gather supplemental materials:

- Application fee
- Official undergraduate and/or graduate transcripts
- Three letters of recommendation
- Statement of Purpose (required for PhD applicants; suggested for MS applicants)
- GRE scores (electronic copies of applicant scores will be used for evaluation purposes, but official scores will be necessary if admitted)
- TOEFL scores (required for all international applicants)
- Financial Certification (required for all international applicants)

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Chair
Arye Nehorai
Eugene and Martha Lohman Professor of Electrical Engineering
PhD, Stanford University
Signal processing, imaging, biomedicine, communications

Associate Chair
Hiro Mukai
Professor
PhD, University of California, Berkeley
Theory and computational methods for optimization, optimal control, systems theory, electric power system operations, differential games

Endowed Professors
R. Martin Arthur
Newton R. and Sarah Louisa Glasgow Wilson Professor of Engineering
PhD, University of Pennsylvania
Ultrasonic imaging, electrocardiography

Joseph A. O’Sullivan
Samuel C. Sachs Professor of Electrical Engineering
PhD, Notre Dame University
Information theory, statistical signal processing, imaging science with applications in medicine and security, and recognition theory and systems

Lan Yang
Edward H. & Florence G. Skinner Professor Electrical & Systems Engineering
PhD, California Institute of Technology
Nano/micro photonics, ultra high-quality optical microcavities, ultra-low-threshold microlasers, nano/micro fabrication, optical sensing, single nanoparticle detection, photonic molecules, photonic materials

Professor
Heinz Schaeftler
PhD, Rutgers University
Optimal control, nonlinear systems, mathematical models in biomedicine

Associate Professors
Jr-Shin Li
PhD, Harvard University
Mathematical control theory, optimization, quantum control, biomedical applications

Robert E. Morley Jr.
DSc, Washington University
Computer and communication systems, VLSI design, digital signal processing
Assistant Professors

ShiNung Ching
PhD, University of Michigan
Systems and control in neural medicine, nonlinear and constrained control, physiologic network dynamics, stochastic control

Zachary Feinstein
PhD, Princeton University
Financial engineering, operations research, variational analysis

Humberto Gonzalez
PhD, University of California, Berkeley
Cyber-physical systems, hybrid dynamical systems, optimization, robotics

Matthew D. Lew
PhD, Stanford University
Microscopy, biophotonics, computational imaging, nano-optics

Jung-Tsung Shen
PhD, Massachusetts Institute of Technology
Theoretical and numerical investigations on nano-photonics, opto-electronics, plasmonics, metamaterials

Xuan “Silvia” Zhang
PhD, Cornell University
Robotics, cyber-physical systems, hardware security, ubiquitous computing, embedded systems, computer architecture, VLSI, electronic design automation, control optimization, and biomedical devices and instrumentation

Senior Professors

I. Norman Katz
PhD, Massachusetts Institute of Technology
Numerical analysis, differential equations, finite element methods, locational equilibrium problems, algorithms for parallel computations

Paul S. Min
PhD, University of Michigan
Routing and control of telecommunication networks, fault tolerance and reliability, software systems, network management

William F. Pickard
PhD, Harvard University
Biological transport, electobiology, energy engineering

Daniel L. Rode
PhD, Case Western Reserve University
Optoelectronics and fiber optics, semiconductor materials, light-emitting diodes (LEDs) and lasers, semiconductor processing electronics

Ervin Y. Rodin
PhD, University of Texas at Austin
Optimization, differential games, artificial intelligence, mathematical modeling

Barbara Schrauner
PhD, Harvard University (Radcliffe)
Plasma processing, semiconductor transport, symmetries of nonlinear differential equations

Donald L. Snyder
PhD, Massachusetts Institute of Technology
Communication theory, random process theory, signal processing, biomedical engineering, image processing, radar

Barry E. Spielman
PhD, Syracuse University
High-frequency/high-speed devices, RF & MW integrated circuits, computational electromagnetics

Tzyh Jong Tarn
DSc, Washington University
Quantum mechanical systems, bilinear and nonlinear systems, robotics and automation, life science automation

Professors of Practice

Dedric Carter
PhD, Nova Southeastern University

Dennis Mell
MS, University of Missouri-Rolla

Ed Richter
BSEE, Virginia Tech

Senior Lecturer

Martha Hasting
PhD, St. Louis University

Lecturers

Randall Brown
PhD, Washington University

Randall Hoven
MS, Washington University
MSEE, Johns Hopkins University
Sensor/Data Fusion, Kalman Filters, navigation, target tracking

Vladimir Kurenok
PhD, Belarus State University (Minsk, Belarus)

Jason Trobaugh
DSc, Washington University

Jinsong Zhang
PhD, University of Miami
Wireless communication systems, wireless sensor networks, target tracking/data fusion, machine learning/pattern classification
Research Professor

Julius Goldstein
PhD, University of Rochester
Auditory system, hearing perception, modeling auditory perception

Research Associate Professor

David Corman
PhD, University of Maryland
Cyber Physical Systems (CPS), Security for CPS, Unmanned systems, manufacturing

Research Assistant Professor

Scott Marrus
MD, PhD, Washington University School of Medicine
Cardiac electrophysiology

Professors Emeriti

William M. Boothby
PhD, University of Michigan
Differential geometry and Lie groups, mathematical system theory

Lloyd R. Brown
DSc, Washington University
Automatic control, electronic instrumentation

David L. Elliott
PhD, University of California, Los Angeles
Mathematical theory of systems, nonlinear difference, differential equations

Marvin J. Fisher
PhD, University of Illinois
Energy conversion, power electronics

Robert O. Gregory
DSc, Washington University
Electronic instrumentation, microwave theory, circuit design

Degree Requirements

Graduate Degree Programs

The Department of Electrical & Systems Engineering offers master's-level and doctoral-level degrees in Electrical Engineering and in Systems Science & Mathematics. At the master's level, the programs require 30 credit hours of study and have both a course option and a thesis option. At the doctoral level, both the PhD and DSc degrees are available, which typically require four to five years of full-time study leading to an original research contribution.

Research activity in the department is focused in the following three areas:

- Applied mathematics, systems & control
- Electronics & optics
- Signal processing, imaging & communications

Students working in any of these areas will enjoy the benefits of programs that balance fundamental theoretical concepts with modern applications. In our department, students find ample opportunities for close interactions with faculty members working on cutting-edge research and technology development.

- PhD in Electrical Engineering
- PhD in Systems Science & Mathematics
- DSc in Electrical Engineering
- DSc in Systems Science & Mathematics
- MS in Electrical Engineering
- MS in Systems Science & Mathematics
- MS in Data Analytics and Statistics
- Master of Control Engineering
- MEng in Robotics
- Graduate Certificate in Imaging Science & Engineering
- Student not candidate for degree

Prospective PhD students with previous degrees in engineering who are interested in PhD studies and research in mathematics or statistics are encouraged to apply for PhD studies in Mathematics and Statistics. For more details, visit http://wumath.wustl.edu/graduate.