COLUMBIA | ENGINEERING
The Fu Foundation School of Engineering and Applied Science

Electrical Engineering

The EE MS program is flexible and customizable to the student's individual goals. It allows students to pursue electrical engineering disciplines in depth, as well as to take a selection of courses from other Columbia engineering majors. Students can study topics from physical devices, to circuits and systems, to communications and networking, to signal, information and data processing, to computer engineering, to smart electric energy, as well as systems biology or neuroengineering.

Program Requirements

Candidates for the M.S. degree in electrical engineering must complete 30 points of credit beyond the bachelor's degree. A minimum of 15 points of credit must be at the 6000 level or higher. No credit will be allowed for undergraduate courses (3000 or lower). At least 15 points must be in electrical engineering, defined as including all courses with an ELEN designator or a joint designator containing electrical engineering as a member, e.g., EECS, CSEE, EEME, ECBM, etc. And it is expected that at least 12 of the first 24 points taken will be in electrical engineering.

Not all technical courses can be applied toward the M.S. degree, and some have restrictions. Also, no more than 6 points of research (such as ELEN E4998, ELEN E6001, and ELEN E6002) can be used, and no more than 3 points of approved courses that do not contain primarily engineering, math, or science content can be used. Any course that is not on the list of standard courses require prior written department approval, including during the summer session.

The general school requirements listed earlier in this bulletin, such as minimum GPA, must also be satisfied. All degree requirements must be completed within five years of the beginning of the first course credited toward the degree.

More details and a checklist for adviser approvals can be found at www.ee.columbia.edu.

Concentrations

Students in the electrical engineering M.S. program often choose to use some of their electives to focus on a particular field. Students may pick one of a number of optional, formal concentration templates or design their own M.S. program in consultation with an adviser. These concentrations are not degree requirements. They represent suggestions from the faculty as to how one might fill one's programs so as to focus on a particular area of interest. Students may wish to follow these suggestions, but they need not. The degree requirements are quite flexible and are listed in the Master of Science Degree section, above. All students, whether following a formal concentration template or not, are expected to include breadth in their program. Not all of the elective courses listed at are offered every year. More details on MS Concentrations in Electrical Engineering can be found here: http://www.ee.columbia.edu/ms-concentrations

COLUMBIA | ENGINEERING
The Fu Foundation School of Engineering and Applied Science

Computer Engineering

The Computer Engineering program combines key aspects of electrical engineering and computer science. In pursuit of a Master of Science degree, students learn the fundamentals of circuits, systems, and software associated with the design of programmable systems as used for general purpose computing, communications, control, or signal processing. Because of their broad skills in both hardware and software, students in computer engineering are in high demand for employment after graduation.

Program Requirements

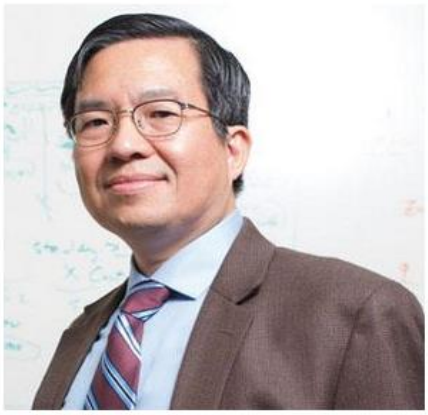
Total: At least 30 credits (at or above 4000-level)
Core Requirement: At least 15 credits from listed "core"
Distribution Requirement: At least 6 credits each from Computer Science and Electrical Engineering
(CSEE and EECS count for either Computer Science or Electrical Engineering)
6000 Level Requirement: At least 15 credits (CS, EE, Joint Courses included)
Research Credits (Optional): No more than 9 credits
Non-Tech Electives: No more than 3 credits
Minimum GPA at least 2.700

Core Computer Engineering Course List:

COMS W4113 Fund. Large-Scale Dist. Sys.
COMS W4115 Prog. Lang. & Translators
COMS W4118 Operating Systems, I
CSEE W4119 Computer Networks
COMS W4130 Parallel Programming
CSEE W4140 Computer Networking Lab
COMS W4180 Network Security
EECS E4321 Digital VLSI Circuits
EECS E4340 Computer Hardware Design
ELEN E4350 VLSI Design lab
ELEN E4702 Digital Communications
ELEN E4750 GPU for Sig. Proc. & Comm.
ELEN E4810 Digital Signal Processing
CSEE W4823 Adv. Logic Design
CSEE W4824 Computer Architecture
ELEN E4830 Digital Image Processing
CSEE W4840 Embedded Systems
ELEN E4896 Music Signal Processing
COMS W6118 Operating Systems, II
CSEE W6180 Modeling & Perf. Evaluation
COMS W6181 Adv. Internet Services
EECS E6321 Adv. Digital Elec. Circuits
ELEN E6350 VLSI Design Lab
ELEN E6488 Optical Interconnects
ELEN E6761 Computer Comm. Net., I
ELEN E6762 Computer Comm. Net., II
EECS E6765 Internet of Things
ELEN E6770 Topic: Next Gen. Networks
CSEE E6824 Parallel Computer Architecture
CSEE E6831 Sequential Logic Circuits
CSEE E6832 Topics in Logic Design
CSEE E6847 Distributed Embedded Systems
ELEN E6850 Visual Information Systems
ELEN E6860 Advanced Digital Sig. Proc.
CSEE E6861 CAD of Digital Systems
CSEE E6868 System-on-chip Platforms
ELEN E6950 Wireless & Mobile Net., I
ELEN E6951Wireless & Mobile Net., II
COMS E6998 (Adv. Dist. Sys.)
COMS E6998 (Resilient Hardware Sys.)
COMS E6998 (Formal Verif. HW/SW)

COLUMBIA | ENGINEERING
The Fu Foundation School of Engineering and Applied Science

Electrical Engineering Faculty



SHIH-FU CHANG

RICHARD DICKER CHAIR PROFESSOR AND SENIOR EXECUTIVE VICE DEAN OF ENGINEERING

PETER KINGET

BERNARD J. LECHNER PROFESSOR OF ELECTRICAL ENGINEERING; CHAIR OF ELECTRICAL ENGINEERING

KEREN BERGMAN

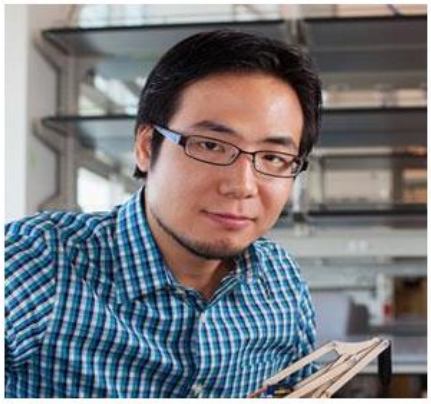
CHARLES BATCHELOR PROFESSOR OF ELECTRICAL ENGINEERING

CHRISTINE P. HENDON

ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING

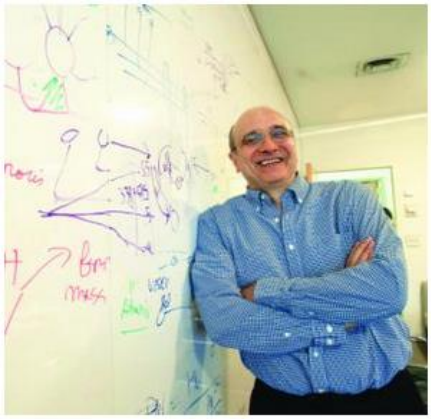
ANDREAS H. HIELSCHER

PROFESSOR OF BIOMEDICAL ENGINEERING, ELECTRICAL ENGINEERING AND RADIOLOGY



XIAOFAN (FRED) JIANG

ASSISTANT PROFESSOR OF ELECTRICAL ENGINEERING AND COMPUTER ENGINEERING



AUREL A. LAZAR

PROFESSOR OF ELECTRICAL ENGINEERING CO-DIRECTOR OF THE CENTER FOR NEURAL ENGINEERING AND COMPUTATION

MICHAL LIPSON

EUGENE HIGGINS PROFESSOR OF ELECTRICAL ENGINEERING AND PROFESSOR OF APPLIED PHYSICS

NIMA MESGARANI

ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING