MASTER OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING

The Master of Science in Electrical and Computer Engineering (MS-ECE) gives students the opportunity to deepen their knowledge and gain hands-on experience in modern technologies of the field. This program offers a set of electrical and computer engineering core courses that deepens and broadens the students' perspectives in the field. In addition, elective courses offer an opportunity for the students to follow their interests and align their coursework with their career objectives. A culminating experience of an applied research project or thesis offers an opportunity for the students to practice their knowledge and gain hands-on research experience. The non-sequential structure of most graduate courses permits students to take courses in their areas of interests without committing themselves to a long series of courses. The 30 unit degree offers a series of increasingly focused courses (lectures and hands-on labs) in electrical and computer engineering, in which students learn how to develop concrete professional skills to be successful in projects. The program takes advantage of the Bay Area's rich industry resources and our students are encouraged to gain hands-on experience and practical knowledge of the field through internship programs. Our program prepares the students to write technical research papers, collaborate with peers for group projects, to enter Ph.D. programs at other universities, and complete lab or practicum requirements as needed. The courses are scheduled in the evenings, keeping in mind the convenience of the working engineers. Close, personal relationships with faculty and other students provides an amiable environment.
Admission Requriements

Admissions Requirements:

a. B.S. in Electrical or Computer Engineering from an ABET-accredited program, or a B.S. and the equivalent of the following courses:
   - Math: MATH 226, MATH 227, MATH 228, and MATH 245
   - Physics: PHYS 230/PHYS 232 and PHYS 240/PHYS 242
   - Engineering: ENGR 205, ENGR 206, ENGR 213, ENGR 301, ENGR 305, ENGR 353, ENGR 356/ENGR 357, ENGR 378, and ENGR 478

b. At the time of admission to the University, the minimum GPA must be 3.0 out of 4.0 for the last 60 units of the applicant's study. An applicant with a GPA higher than 2.8 but less than 3.0 may fill out a University waiver form for this requirement and submit it with the other Engineering Requirements to:
Engineering Graduate Program Coordinator
School of Engineering
1600 Holloway Avenue
San Francisco, CA 94132

Additional Admission Requirements:

a. For the applicants with mainly non-English preparatory education, a minimum score for TOEFL (Institution cod -4683) is 550 for paper-based and 80 for Internet-based is required. Alternatively, this requirement may be satisfied by a minimum IELTS of 7.0 or PTE Academic of 65.

b. The School of Engineering also requires two letters of recommendation from persons familiar with the applicant's previous academic work or professional accomplishments.

c. Non-Electrical and Computer Engineering applicants holding any B.S. degree may apply to our graduate program for conditional admission consideration. In those cases:
   - Applicants must have a record well above the university minimum admission requirements stated above and be able to clearly demonstrate their potential in Engineering.
   - Conditional graduate students may apply for advancement to classified graduate status, after satisfying the minimum admission requirements listed in Section A above.
   - No conditional admission is issued to international students with a B.S. degree in non-Electrical and Computer Engineering programs.

Program Learning Outcomes

a. Develop critical thinking for research findings and engineering practice in their field of expertise and the capability to be able to clearly articulate and apply such knowledge in their research and practice.

b. Develop effective writing skills for both informal and formal professional communications and skills to orally present scientific material to a broad range of audiences.

c. Demonstrate the ability to work effectively in teams on complex electrical and computer engineering problems.

Electrical and Computer Engineering (M.S.) — 30 units minimum

Core Courses (12 units)

Code	Title	Units
ENGR 844	Embedded Systems	3
ENGR 845	Neural-Machine Interfaces: Design and Applications	3
ENGR 850	Digital Design Verification	3
ENGR 852	Advanced Digital Design	3

Elective Courses (12-15 units)

Code	Title	Units
ENGR 415	Mechatronics	4
ENGR 445	Analog Integrated Circuit Design	4
ENGR 446 & ENGR 447	Control Systems Laboratory and Control Systems	4
ENGR 449	Communication Systems	3
ENGR 451	Digital Signal Processing	4
ENGR 453	Digital Integrated Circuit Design	4
ENGR 454	Application Specific Integrated Circuit Design	4
ENGR 456	Computer Systems	3
ENGR 476	Computer Communications Networks	3
ENGR 478	Design with Microprocessors	4
ENGR 491		3
ENGR 492	Hardware for Machine Learning	3
ENGR 498	Advanced Design with Microcontrollers	4
ENGR 800	Research Methodology	3
ENGR 801	Engineering Management	3
ENGR 848	Digital VLSI Design	3
ENGR 849	Advanced Analog IC Design	3

ENGR 851	Advanced Microprocessor Architectures	3
ENGR 853	Advanced Topics in Computer Communication and Networks	3
ENGR 854		3
ENGR 855		3
ENGR 856	Nanoscale Circuits and Systems	3
ENGR 868	Advanced Control Systems	3
ENGR 869	Robotics	3
ENGR 890	Static Timing Analysis for Nanometer Designs	3
ENGR 897	Research	3
ENGR 899	Independent Study	1-3

- Up to 6 units of electives may come from non-Engineering courses numbered 400 and higher in MATH, PHYS, CHEM, CSC, BUS, ACCT, or ISYS with the approval of the Engineering graduate program coordinator.
- Electives in Engineering completed at other institutions require approval of the Engineering graduate program coordinator.
- Only 9 units of upper-division undergraduate coursework may count toward the degree requirements.

Culminating Experience (3-6 units)

Select one option:

Option A

Code	Title	Units
ENGR 897 & ENGR 898	Research and Master's Thesis (thesis may not be started until completion of 12 units of graduate course work and ENGR 897)	6

Option B

Code	Title	Units
ENGR 895	Applied Research Project (project may not be started before completing 12 units of graduate coursework)	3