

# Electrical and Computer Engineering, Ph.D.

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The Department offers M.S. and Ph.D. degrees in Electrical and Computer Engineering with a concentration in Electrical Engineering and in Computer Engineering. Because most graduate courses are not repeated every quarter, students should make every effort to begin their graduate program in the fall.

## Electrical Engineering Concentration (EE)

The Electrical Engineering faculty study the following areas: optical and solid-state devices, including quantum electronics and optics, integrated electro-optics, design of semiconductor devices and materials, analog and mixed-signal IC design, microwave circuits antenna and devices, and nano imaging; systems engineering and signal processing, including communication theory, signal processing, power electronics, neural networks, communications networks, systems engineering, and control systems. Related communication networks topics are also addressed by the Networked Systems M.S. and Ph.D. degrees (listed in the Interdisciplinary Studies section (<http://catalogue.uci.edu/interdisciplinarystudies/>) of the *Catalogue*).

## Computer Engineering Concentration (CPE)

The concentration in Computer Engineering provides students with a solid base in the design, development, and evaluation of computer systems and software. Thrust areas include computer architecture, software design, and embedded systems, but the program is highly customizable to the specific interests of the student. The research activities of the faculty in this concentration include parallel and networked computer systems, distributed software architectures and databases, real-time and embedded computer systems, VLSI architectures, computer design automation, low-power design, computer communication protocols and networks, security, programming languages for parallel/distributed processing, knowledge management, service-oriented architectures, and software engineering.

The doctoral program in Electrical and Computer Engineering is tailored to the individual background and interest of the student. There are several milestones to pass: admission to the Ph.D. program by the Graduate Committee; Ph.D. preliminary examination on the background and potential for success in the doctoral program; departmental teaching requirement which can be satisfied through service as a teaching assistant or equivalent; original research work; development of a research report and dissertation proposal; advancement to Ph.D. candidacy in the third year (second year for students who entered with a master's degree) through the Ph.D. qualifying examination conducted on behalf of the Irvine Division of the Academic Senate; completion of a significant research investigation with original results; and completion and approval of a dissertation. The Ph.D. dissertation is written documentation of original research that has impact on the field of study for the Ph.D. A public Ph.D. dissertation defense is also required. During the Ph.D. study, four units of EECS 294 must be completed. All Ph.D. students, including those earning a M.S., are required to take a minimum of four units (potentially more per discussion and approval from faculty research advisor) of EECS 296, EECS 297, or EECS 299 in every quarter of the Ph.D. program.

The Ph.D. preliminary examination is conducted twice a year, in the fall and spring quarters. Detailed requirements for each concentration are specified in the departmental Ph.D. preliminary examination policies, available from the EECS Graduate Admissions Office. A student who already has an M.S. on enrollment must pass the Ph.D. preliminary examination within one complete academic year cycle after entering the Ph.D. program. A student who does not already have an M.S. on enrollment must pass the Ph.D. preliminary examination within two complete academic year cycles after entering the Ph.D. program. A student has only two chances to take and pass the Ph.D. preliminary examination. A student who fails the Ph.D. preliminary examination twice will be asked to withdraw from the program, or will be dismissed from the program, and may not be readmitted into the program.

The Ph.D. is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. Part-time study toward the Ph.D. is not permitted. The normative time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

## Program in Law and Graduate Studies (J.D./M.S.-ECE; J.D./Ph.D.-ECE)

Highly qualified students interested in combining the study of law with graduate qualifications in the ECE program are invited to undertake concurrent degree study under the auspices of UC Irvine's Program in Law and Graduate Studies (PLGS). Students in this program pursue a coordinated curriculum leading to a J.D. degree from the School of Law in conjunction with a Master's or Ph.D. degree in the ECE program. Additional information is available from the PLGS Program Director's Office, 949-824-4158, or by email to [plgs@uci.edu](mailto:plgs@uci.edu). A full description of the program, with links to all relevant application information can be found at the School of Law Concurrent Degree Programs website (<http://www.law.uci.edu/academics/interdisciplinary-studies/concurrent-degrees.html>) and in the Law School section (<http://catalogue.uci.edu/schooloflaw/#lawandgraduatestudies>) of the *Catalogue*.