Software Engineering, Ph.D.

A new code search engine. New insights into how trust emerges (or doesn't) in distributed software development organizations. New visualizations to aid developers in debugging code. New lessons about the quality of open-source components. A new Internet infrastructure that enables secure computational exchange.

These are just some examples of the wide variety of projects being worked on by current Ph.D. students in the software engineering Ph.D. program at UC Irvine.

As software continues to transform society in dramatic and powerful ways, we must improve our ability to reliably develop high-quality systems. From early incarnations as just an idea or set of requirements to when software is actually built, deployed and customized in the field, many challenges exist across the lifecycle that make creating software still a non-trivial endeavor today.

The software engineering Ph.D. program offers students the opportunity to tackle these challenges, whether it is through designing new tools, performing studies of developers and teams at work, creating new infrastructures or developing new theories about software and how it is developed. No fewer than six faculty members bring a broad range of expertise and perspectives to the program, guaranteeing a diverse yet deep education in the topic.

A strong core of classes introduces students to classic material and recent innovations. At the same time, we focus on research from the beginning. New students are required to identify and experiment with one or more research topics early, so that they can become familiar with the nature of research, write papers, attend conferences and begin to become part of the broader software engineering community. This focus on research naturally continues throughout the program, with an emphasis on publishing novel results in the appropriate venues.

For additional information about this degree program, please see: https://www.informatics.uci.edu/grad/phd-software-engineering/

Program of Study

Pre-Candidacy Course Requirements

Students must complete a software engineering core course, five elective courses, and at least three quarters of individual study and/or thesis supervision courses. Students must take additional courses of their own choosing or additional individual studies, in order to fulfill 48 units before advancement to candidacy. The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor.

1. Software Engineering Core Courses:	
SWE 211	Software Engineering
2. Complete five Software Engineering electives. [1]	
3. Complete at least three quarters of individual study and/or thesis supervision courses.	
4. Students must complete additional courses of their own choosing or additional individual studies, in order to fulfill 48 units before advancement to candidacy. [2]	
Additionally, students are expected to attend at least 20 talks from within the several seminar series in ICS. Attendance bears no course credit, but it is required for advancement to candidacy. [3]	

1. All five elective courses must be regular, 4-unit courses from the School of Information and Computer Sciences. At least three of the elective courses should be from the SWE 2XX series. Individual study, thesis supervision, and seminars do not qualify as electives.
2. The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor.
3. The student's faculty advisor is responsible for ensuring this requirement is met.

Qualifying Examinations

Research Assessment

Students must find a faculty advisor and successfully complete a research project with that faculty member. The research project should be done over at least two quarters of independent study with that faculty member. The goal of this research assessment is to introduce the student to the practice of scientific publication.

Based on the project, the student must produce a research paper of publishable quality. This research paper must be reviewed by three faculty members in a peer-review process, revised by the student, and approved by the three faculty members.

The research assessment is graded Ph.D. PASS, M.S. PASS, or FAIL. In case of M.S. PASS or FAIL, the student can re-submit the paper at most one more time within the maximum period of six months. A second M.S. PASS or FAIL results in disqualification from the doctoral program.

Advancement to Candidacy Examination

Each Ph.D. student must pass the oral advancement to candidacy exam, which assesses the student's ability to conduct, present, and orally defend research work at the doctoral level. The research project and paper are the basis for the student's oral advancement to candidacy exam. The oral candidacy exam consists of the research presentation by the student, followed by questions from the candidacy committee.

The student must complete the course requirements, and pass the research assessment prior to advancing to candidacy. The candidacy committee will consist of five faculty members, the majority of whom must be members of the student's program, and is conducted in accordance with UCI Senate regulations.

Dissertation Topic Defense

The student must present a carefully articulated document representing the student's dissertation plan. This document must include the proposed dissertation abstract, a discussion of the approach, a comprehensive survey of related work, and a plan for completing the work. The dissertation plan is presented by the student to the dissertation committee, who must unanimously approve the student's proposal. The dissertation defense committee is formed in accordance to UCI Senate regulations.

Doctoral Dissertation and Final Examination

Students are required to complete a doctoral dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral thesis defense which consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. The committee must approve the thesis unanimously.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

Requirements Beyond Graduate Division Minimum Requirements

All Ph.D. students are expected to maintain a minimum GPA of 3.5 throughout the program. Failure to maintain this minimum will result in a recommendation that the student be disqualified. In addition, no grade lower than a B is counted toward satisfying any course requirements.