

**Electrical Engineering and Computer Science  
Ph.D. AND MS DEGREE REQUIREMENTS**

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## A. Introduction

- 1) Aims and Scope:** The EECS program at UC Merced offers individualized, strongly research-oriented courses of study. Students pursue world-class, interdisciplinary, cutting-edge research leading to either M.S. or Ph.D. degrees. Our world-class faculty members pursue research on a wide range of topics in Computer Science, Computer Engineering, and Electrical Engineering.
- 2) Admissions Requirements:** A person seeking admission to EECS Graduate Group must have earned a bachelor's degree (with a minimum GPA of 3.0) and must submit three letters of recommendation, official transcripts, GRE scores, TOEFL or IELTS score (if applicable) and the graduate online application with fee by the stated admission deadline. Incomplete applications will not be evaluated by the admission committee and therefore, be rejected without further consideration. Applicants are encouraged to specify their research interests in their statement of purpose, possibly linking them to the activities of current EECS faculty members. Admission decisions are made on a case-by case basis. Meeting some or all of these criteria does not guarantee admission, but merely eligibility. Completed applications are reviewed by the EECS Admissions Committee which makes recommendations for admission (generally, on the basis of available space and the competitiveness of applicants compared to the eligible pool) to the Vice Provost and Dean of Graduate Education, who makes final decisions on admission. An applicant to EECS may be granted provisional admission, pending remedial actions (e.g., receipt of GRE scores, classes that would enable the student to take EECS graduate classes, etc.).

  - a) Prerequisites:** There are no general prerequisites for admission. However, if the bachelor's degree of an applicant is not in CSE, ECS, EECS, Applied Mathematics, or a related area, he/she may be required to take some basic higher level undergraduate computer science courses to make up for the coursework deficiencies. There is no specified list of these courses and the situation of a student is handled on a case by case basis.
  - b) Deficiencies:** Coursework deficiencies should be made up by the end of the first academic year, following initial enrollment by earning a letter grade of "B" or better.
- 3) General Committees:** The EECS program has two committees: Executive Committee and Admissions Committee. The responsibilities of the Education Policy Committee default to the Executive Committee.

  - a) Executive Committee:** The Executive Committee (EC) shall, in consultation with the faculty, determine and implement policies for the good of the graduate studies, establish and guide the educational requirements, and represent the interests of EECS to University and other agencies. The EC consists of at least three EECS faculty members and is populated by nomination and plurality vote of the group core members of the EECS faculty. The EECS Chair will then inform the Graduate Division with a written memo indicating its composition. The EECS Chair will serve as an ex-officio member of the EC. The normal term of appointment of the EC is three years. The EC will make decisions concerning petitions asking for deviations from the rules specified in this handbook. A unanimous vote is required to grant exceptions. The EC will be responsible for reviewing applications from faculty who wish to be a core or affiliate member of EECS. In addition, the EC will review core and affiliate memberships every five years and may decide to remove memberships or affiliations of faculty no longer pursuing activities related to EECS.
  - b) Admission Committee:** The Admission Committee is charged with the development of recruiting materials for the Group, reviewing applications for admissions, making recommendations for admissions to the Dean of Graduate Studies, exploring graduate student support mechanisms, and allocating intramural financial assistance. The

Admission Committee consists of three EECS faculty members and is populated by nomination and plurality vote of the group core members of the EECS faculty. The Chair will then inform the graduate division with a written memo indicating its composition. The normal term of appointment is three years.

- c) **Education Policy Committee:** EECS does not have an Education Policy Committee and the responsibilities of the Education Policy Committee default to the Executive Committee.

## **B. Master's Degree Requirements**

Upon enrollment at UC Merced, each student pursuing a M.S. degree in EECS is assigned a *graduate advisor*. The graduate advisor must be a faculty member of EECS. Supervision by an affiliate member of EECS is allowed contingent on approval by the Executive Committee. When the student advances to candidacy, the student's graduate advisor, normally in consultation with the student, the EECS Chair, and other faculty, recommends the appointment of a committee to advise and supervise the student's progress (*M.S. committee*). The M.S. committee consists of at least three faculty belonging to EECS (either members or affiliated). Under special circumstances one of the committee members can be a UC Merced professor from outside EECS, a regular or adjunct faculty member from any UC campus, or an individual from outside the University of California who has special expertise and qualifications. In this case, the graduate advisor should submit a brief statement indicating the appointee's affiliation and title and how the prospective appointee has special expertise or qualifications that are not represented on the campus. In addition to the justification letter from the graduate advisor, a curriculum vita and a letter from the proposed appointee indicating a willingness to serve must be submitted to the EECS Chair. Final approval of the membership on the M.S. committees rests with the Dean of Graduate Studies. A student may petition in writing to the Executive Committee to be assigned a different graduate advisor, and the final decision rests with the committee. The Executive Committee may also decide to change the graduate advisor without a formal request from the student.

A student's GPA must be at least 3.0 in all the courses taken towards the MS degree. An MS degree student may count at most one course with B- grade without petition towards his MS degree. Under no circumstances, a student is allowed to count more than one course with B- grade or count a course with grade lower than B- towards his MS degree even through the petition process.

The master's degree is attained by Plan I, the Thesis option, or Plan II, the Comprehensive Examination option. Each of these plans has minimal coursework requirements. A minimum of two semesters in academic residence is required prior to the award of a master's degree. A capstone element in master's degrees is satisfied by the requirement of thesis or comprehensive examination.

**Degree Plan I- Thesis:** In addition to an approved thesis, a minimum of 30 semester units in course work is required which must satisfy the criteria: At least 20 units should be earned in 200 series EECS graduate level courses. 200 series graduate level courses in other disciplines may be counted towards these 20 units with the approval of the graduate advisor. All courses taken to satisfy this 20 unit requirement must be taken for a letter grade. (Any credit earned for thesis research and any units earned for courses with number 290 and above cannot be counted towards these 20 units). The coursework for the remaining 10 units must be approved by the graduate advisor and it may include 200 series research or independent study courses with S/U grading policy.

In addition, 2 semester units must be earned attending the EECS seminar (EECS 290).

- a) **Program Learning Outcomes (PLOs):** Graduates of the M.S. in Electrical Engineering and Computer Science with Plan I (Thesis)

1. Are able to conduct supervised research in electrical engineering and computer science and are able to situate this research in the contexts of current research literatures.
2. Are able to apply their knowledge of computing, mathematics, science, and engineering to the design and implementation of solutions, under appropriate guidance, to technological problems.
3. Are able to conduct experiments and computational simulations for the purpose of evaluating and comparing proposed solutions on the basis of empirical evidence.
4. Possess the characteristics of lifelong learners; they are able to acquire and use new techniques, skills, and engineering and scientific tools for research and development practice in electrical engineering and computer science.
5. Practice a high standard of professional ethics, including integrity in the conducting and writing of research.
6. Communicate effectively through oral, visual, and written means, effectively addressing a broad range of technical audiences.

**b) Course Requirements - Core and Electives (total # units)**

There are no Core and Elective course requirements. Students are free to choose any eligible graduate course with the approval of the graduate advisor. A minimum course load of 12 units must be carried each academic semester.

**c) Special Requirements: "N/A."**

**d) Advancement to Candidacy:** In accordance with University of California policy, students must be advanced to candidacy for their degree prior to the beginning of the final semester of enrollment. A student is not required to finish all the coursework prior to advancing to candidacy. A student's GPA must be at least 3.0 in all the courses taken to advance to Candidacy. An Application for Advancement to Candidacy initiated by the student and approved by the Graduate Group should be submitted to the Graduate Dean before (preferably 30 days before) the opening of the semester in which the degree is expected. The Application must be accompanied by petitions for any course credits that have not already been approved by the Graduate Dean. A three-person committee to evaluate the final MS thesis must also be established when advancing to candidacy. At least one member of the committee should not have any direct vested interest in the success of the student (e.g., not a collaborator or the advisor). The EECS Chair and the graduate student must sign the Statement of Conflict of Interest form, which is included in the Application.

**e) Thesis Requirements:** Research for the Master's thesis is to be carried out under the supervision of the graduate advisor of the student and must represent a contribution to knowledge in the field. The thesis research must be conducted while the student is enrolled in the program. The candidate and the graduate advisor should meet at least once a year with the other members of the thesis committee to discuss progress and any changes in research objectives. The thesis is submitted to the thesis committee at least 30 days before the scheduled defense. The defense may be organized as a public seminar, presenting the results of the work. However, this is not a requirement, and the final decision about the form of defense rests with the committee. All committee members must approve the thesis in its entirety and sign the title page before the thesis is submitted electronically to the Graduate

Division for final approval. Should the committee determine that the thesis is unacceptable, even with substantial revisions, the program Chair may recommend the student for disqualification from the program to the Vice Provost and Dean of Graduate Education.

The thesis must be submitted by the deadline in the semester in which the degree is to be conferred. Those students who complete the requirements and submit the thesis after the end of the semester and prior to the start of the subsequent semester will earn a degree for the following semester, but will not be required to pay fees for that semester. Instructions on preparation of the thesis are available in the UCM Thesis and Dissertational Manual and a schedule of dates for filing the thesis in final form are published on the Graduate Division website in the calendar and deadlines section.

**Degree Plan II- Non-thesis:** In addition to the comprehensive examination, a minimum of 30 semester units in course work is required, which must satisfy the criteria: At least 24 units should be earned in 200 series EECS graduate level courses. 200 series graduate level courses in other disciplines may be counted towards these 24 units with the approval of the graduate advisor. All courses taken to satisfy this 24 units requirement must be taken for a letter grade. (Any credit earned for thesis research and any units earned for courses with number 290 and above cannot be counted towards these 24 units). The coursework for the remaining 6 units must be approved by the graduate advisor and it may include 200 series research or independent study courses with S/U grading policy. In addition, 2 semester units must be earned attending the EECS seminar (EECS 290).

**a) Program Learning Outcomes (PLOs):** Graduates of the M.S. in Electrical Engineering and Computer Science for Degree Plan II:

1. Are able to apply their knowledge of computing, mathematics, science, and engineering to the design and implementation of solutions, under appropriate guidance, to technological problems.
2. Are able to conduct experiments and computational simulations for the purpose of evaluating and comparing proposed solutions on the basis of empirical evidence.
3. Possess the characteristics of lifelong learners; they are able to acquire and use new techniques, skills, and engineering and scientific tools for research and development practice in electrical engineering and computer science.
4. Practice a high standard of professional ethics, including integrity in the conducting and writing of research.
5. Communicate effectively through oral, visual, and written means, effectively addressing a broad range of technical audiences.

**b) Course Requirements - Core and Electives (total # units)**

There are no Core and Elective course requirements. Students are free to choose any eligible graduate course with the approval of the graduate advisor. A minimum course load is 12 units must be carried each academic semester.

**c) Special Requirements:** "N/A."

**Advancement to Candidacy:** In accordance with University of California policy, students must be advanced to candidacy for their degree prior to the beginning of the final semester of enrollment. A student is not required to finish all the coursework prior to advancing to candidacy. A student's GPA must be at least 3.0 in all the courses taken to advance to Candidacy. An Application for Advancement to Candidacy initiated by the student and approved by the Graduate Group should be submitted to the Graduate Dean before (preferably 30 days before) the opening of the semester in which the degree is expected. The Application must be accompanied by petitions for any course credits that have not already been approved by the Graduate Dean. For the M.S. degree Plan II, a three-person committee to evaluate the final written paper or project report must also be established when advancing to candidacy. At least one member of the committee should not have any direct vested interest in the success of the student (e.g., not a collaborator or the advisor). No qualifying examination is requested for the M.S. degree. The EECS Chair and the graduate student must sign the Statement of Conflict of Interest form, which is included in the Application.

**d) Comprehensive Examination:** The comprehensive examination will incorporate and satisfy the capstone requirements. A project or a paper will synthesize two or more topics typically covered in a class or a set of classes. For a group-based project or a group-based paper, the individual student's contributions will be documented and assessed through robust means. The EECS Chair will serve as the single coordinator to insure the consistent quality and scope of the projects or the written papers. The Chair can insure this when he signs off the forms for the "Advancement to Candidacy". In case the EECS Chair has a COI, the EECS Executive Committee will perform this task.

i) **Timing:** Students may take the comprehensive examination once they have advanced to candidacy. However, it is important that the timing of the exam satisfy the regulations as noted in the CCGA handbook<sup>1</sup>, which indicates that the capstone requirement be completed at or near the end of the coursework for the Master's degree.

ii) **Outcome:** Examinations can result in either a pass, fail, or partial pass by unanimous consensus of the Comprehensive Examination Committee. The categories are described below.

- a. A student has passed when the Comprehensive Examination Committee unanimously votes that the student passed the entire examination with scholarship that is at least acceptable. The committee must report to the Graduate Council via the Vice Provost and Dean of Graduate Education within 30 days. If agreed unanimously by the committee the student may be allowed to make minor modifications prior to submitting the results of the examination.
- b. The committee's unanimous vote is required to pass a student on the exam. If a student does not pass the exam, the committee may recommend that the student be reexamined one more time on the entire examination or on the components failed. The second exam must take place (time) of the first exam. The second exam may have a format different from the first, but the substance should remain the same. The examination may not be repeated more than once. A student who does not pass on the second attempt is subject to disqualification from further graduate work in the program.
- c. A student has partially passed when the Comprehensive Examination Committee votes unanimously that the student passed some components but

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<sup>1</sup> Policies Affecting Graduate Degree Programs, page 1, of <http://senate.universityofcalifornia.edu/committees/ccga/CCGAHandbook2012-13FinalDraft.pdf>

failed others. In this instance, the following apply:

- i. The student has the option of taking a second examination as detailed in above on the components failed; and
  - ii. The chair of the committee must write a letter to the student, with a copy to the Graduate Division, conveying the information about the student's performance (pass, fail, or partial pass) on each of the components covered during the examination.
- e) **Degree Plan- Professional Masters**  
*Policies and Procedures* for Professional Masters programs are in development at the campus level.
- f) **Advising Structure and Mentoring:** The Graduate Advisor is the faculty member who supervises the student's research and thesis. The Graduate Advisor, who is appointed by Graduate Group Chair, is a resource for information on academic requirements, policies and procedures, and registration information until the Thesis Committee is formed. The Graduate Group Staff assists students with identifying appointments and general university policies. The Mentoring Guidelines can be found in UCM Mentoring Guidelines.

**Master's Degree Committees:** The following committees are relevant to a Master's education in EECS:

- a) **Thesis Committee:** A Thesis Committee is comprised of a minimum of three faculty members, including the chair of committee, and all three committee members shall always be a member of the Merced Division and the chair of committee shall always be a member of the Graduate Group supervising the master's program. The student, in consultation with his/her graduate advisor and graduate group chair, nominate two faculty members to serve on the Thesis Committee. These nominations are submitted to the Graduate Division for formal appointment in accordance with Graduate Council policy. A committee of three faculty members shall approve the subject, pass on the content of thesis, and administer the general examination. Usually one of the committee members directs the work.
- b) **Comprehensive Examination Committee:** A Comprehensive Examination Committee is comprised of a minimum of three faculty members, including the chair of committee, and all three committee members shall always be a member of the Merced Division and the chair of committee shall always be a member of the Graduate Group supervising the master's program. The student, in consultation with his/her graduate advisor and graduate group chair, nominate two faculty members to serve on the Comprehensive Examination Committee. These nominations are submitted to the Graduate Division for formal appointment in accordance with Graduate Council policy. A committee of three faculty members shall approve the subject, pass on the content of examination, and administer the examination. Usually one of the committee members directs the work.
- g) **Normative Time to Degree:** Normative Time to complete all requirements for the degree is two years, assuming that the student is engaged in full-time study and making adequate progress. The student must advance to candidacy and complete the degree within the limitations established by the Graduate Group and approved by the Graduate Council.
- h) **Typical Timeline and Sequence of Events:** Here is a typical example of a study plan: (Any deficiencies at admission will affect the timeline, depending upon the severity of the deficiency.)

<i>Year One</i>	<i>Fall</i>	<i>Spring</i>
	<i>Take 12 units of Graduate courses</i>	<i>Take 12 units of Graduate courses</i>



		<i>Take 1 unit of EECS 290.</i>
<b><i>Year Two</i></b>	<b><i>Fall</i></b>	<b><i>Spring</i></b>
	<i>Take 12 units of Graduate courses</i>	<i>Take 12 units of Graduate courses</i>
	<i>Take 1 unit of EECS 290.</i>	<i>Complete and defend MS Thesis or Complete Comprehensive examination</i>

**i) Sources of Funding:** Limited funding opportunities are available to Master’s degree students as Teaching Assistants and as Graduate Student Researchers on the campus.

**C. Doctoral Degree Requirements**

- 1) Program Learning Outcomes (PLOs):** After earning their Ph.D. degrees, the students
- Are able to identify novel and significant open research questions in electrical engineering and computer science and are able to situate such questions in the contexts of current research literature.
  - Are able to apply their knowledge of computing, mathematics, science, and engineering to the analysis of technological problems, as well as to the design and implementation of viable solutions to those problems.
  - Are able to design and conduct experiments and computational simulations for the purpose of evaluating and comparing proposed solutions on the basis of empirical evidence
  - Possess the characteristics of lifelong learners; they are able to acquire and use new techniques, skills, and engineering and scientific tools for research and development in electrical engineering and computer science, as well as to develop new methods and make new discoveries.
  - Practice a high standard of professional ethics, including integrity in the conducting and writing of research.
  - Communicate effectively through oral, visual, and written means, effectively addressing a broad range of technical audiences.
  - Are able to identify novel and significant open research questions in electrical engineering and computer science and are able to situate such questions in the contexts of current research literature.
  - Are able to apply their knowledge of computing, mathematics, science, and engineering to the analysis of technological problems, as well as to the design and implementation of viable solutions to those problems.

**2) Course Requirements** – A Ph.D. student must complete a minimum of 32 units in course work, satisfying the following requirements: At least 24 units should be earned in 200 series EECS graduate level courses. 200 series graduate level courses in other disciplines may be counted towards these 24 units with the approval of the graduate advisor; however, in all circumstances at least 16 units of these 24 units must be in EECS courses. All courses taken to satisfy this 24 units requirement must be taken for a letter grade. (Any credit earned for thesis research and any units earned for courses with number 290 and above cannot be counted towards these 24 units). The coursework for the remaining 8 units must be approved by the graduate advisor and it may include 200 series research or independent study courses with S/U grading policy.

The student, in close collaboration with his/her graduate advisor, will decide upon an appropriate selection of courses that will ensure both breadth and depth, as required by the nature of the Ph.D. degree. A Ph.D. student is also required to earn 3 units attending the EECS seminar (EECS290) in addition to the abovementioned 32 units.

Students can petition the Executive Committee to have a course requirement waived if a similar course was taken while the student was enrolled in a graduate program in a related field at another

institution. The *General Petition* form should be used for all requests for waivers of course work. Up to 16 of the 32 units of required coursework can be waived. Under exceptional circumstances students can petition to waive more than 16 units (e.g., a student transferring to UC Merced after having completed a significant portion of his/her PhD work at a different institution). In any case the decision rests with the Executive Committee.

During his study at UC Merced, a Ph.D. student can take graduate courses in other UC campuses and count them towards the Ph.D. degree unit requirements at UCM (without a petition or a waiver request). Since many other UC campuses are on quarter system, the unit equivalency for such courses will be determined by the formula used by the School of Engineering when transferring students from other UC campuses to UC Merced.

**a) Core and Electives (total # units)**

There are no Core and Elective course requirements. Students are free to choose any eligible graduate course with the approval of the graduate advisor. A minimum course load is 12 units must be carried each academic semester.

**3) Special Requirements:**

**a) Teaching Requirement:** All students pursuing a Ph.D. degree in EECS are required to complete at least one semester as Graduate Student Instructor (also known as Teaching Assistant or TA).

**b) Language Requirement:** N/A

**c) Seminar:** All students pursuing a Ph.D. degree in EECS, are required to give at least two open technical seminars during their residence. The topic of the seminar may be the student's own research or it may be any other topic that falls within the areas of study spanned by the group, broadly defined. Each seminar may be presented as part of a regular seminar series or, if necessary, as a special seminar. The open public presentation given as part of the Ph.D. defense may be counted as one of the required seminars.

**4) Dissertation Plan:** In accordance with University of California policy, a minimum of four semesters in academic residence is required prior to awarding the Ph.D. Typically, a longer period of study, four to six years, is required for completion of all degree requirements. It is the responsibility of the Graduate Group to inform the student upon admission to the program of the expected degree time. All graduate students are considered resident graduates not candidates for a degree, unless admitted to candidacy after completion of all candidacy requirements and approval by the Graduate Division after formal application. A student advances to candidacy for the Ph.D. upon successfully demonstrating a high level of scholarship at the Ph.D. level, and upon completing all preparatory work and demonstrating readiness to proceed to the dissertation phase

**5) Advising Structure and Mentoring:** The Graduate Advisor is the faculty member who supervises the student's research and dissertation. The Graduate Chair, who is appointed by the Vice Provost and Dean of Graduate Education, is a resource for information on academic requirements, policies and procedures, and registration information until the Doctoral Committee is formed. The Graduate Group Coordinator assists students with identifying appointments and general university policies. The Mentoring Guidelines can be found at [UCM Mentoring Guidelines](#).

In order to ensure satisfactory progress toward the degree, each student pursuing a Ph.D. degree must meet with his/her faculty research advisor on a regular basis. After advancing to candidacy every student is expected to meet at least once per year with the thesis committee. Such meeting

shall happen before the yearly annual evaluation by the EECS faculty. The responsibility to organize this meeting rests with the student advisor. In addition, an annual evaluation of progress takes place for all Ph.D. students, normally during the Spring term. For the yearly evaluation all students are required to submit to their respective graduate research advisor a one page document outlining their progress since their previous evaluation. Students must be given at least two weeks to prepare their report, and must submit their report at least one week before the yearly evaluation takes place. The evaluation of progress is conducted by a joint meeting of all faculty members in EECS, and each individual report is introduced by the graduate student research advisor. Faculty will review the student's progress toward the degree during the past year and, when appropriate, formulate suggestions for completion of the remaining requirements. The annual report will become part of the student's record, and will be discussed with the student by his/her graduate research advisor

**6) Doctoral Degree Committees:** The following committees are relevant to PhD education in the EECS.:

**a) Candidacy Committee:** The Candidacy Committee is charged with determining the fitness of the student to proceed with the doctoral dissertation through a formal Qualifying Examination. The Candidacy Committee is comprised of a minimum of three faculty members who are voting members of the University of California Academic Senate and nominations of non-faculty members (i.e., Professional Researchers or faculty members from other universities) will be considered on an exception-only basis. The student, in consultation with the graduate advisor, nominates three faculty members to serve on the Candidacy Committee. These nominations are submitted to the Graduate Group Chair for formal appointment in accordance with Graduate Council policy. The Application for Qualifying Examination available on the Graduate Division website must be submitted one month prior to the proposed examination date. Students must be in good academic standing and registered for the semester in which the examination is held. The Candidacy Committee conducts the exam and submits results to the Graduate Division using the Qualifying Examination Report Form. Refer to the Graduate Policies and Procedures Handbook on Doctoral Candidacy Committee for further details on the appointment process.

**b) Doctoral Committee:** The Doctoral Committee shall supervise the preparation and completion of the dissertation and the final examination. The Doctoral Committee is a three-member committee selected by Candidacy Committee, in consultation with the graduate student, the doctoral committee chair (usually the graduate advisor), and the Graduate Group Chair, on the Advancement to Candidacy for the Degree of Doctor of Philosophy Form. The majority of the committee should be affiliated with the program. The role of the Dissertation Committee is to advise the doctoral student on the research topic and methods, and then to review the final completed dissertation for acceptance. The Doctoral Committee Chair should determine the desires of the individual members regarding assistance with the research and dissertation review at the time the doctoral committee is constituted. Students are expected to meet with the Chair of their doctoral committee regularly. Doctoral committee members are expected to read and comment on a dissertation within four weeks from its submission. The student and doctoral committee members will coordinate a timeline for the student to present the thesis to the doctoral committee. This timeline must allow all doctoral committee members enough time to fulfill their responsibilities within the indicated deadline.

**7) Advancement to Candidacy:** Before advancing to candidacy for a doctoral degree, a student must have maintained a minimum GPA of 3.0 in all course work undertaken, and must have passed unanimously the Qualifying Examination before the Candidacy Committee appointed to administer that examination. Normally, students advance by the end of the four to six semesters, depending upon the area of specialization. The student must file the appropriate paperwork

(Advance to Candidacy for the Degree of Doctor Philosophy Form and Conflict of Interest Form) with the Graduate Division and pay the candidacy fee in order to be officially promoted to Ph.D. Candidacy

Upon successful completion of the Qualifying Examination, the student is entitled for advancement to candidacy and is required to complete the formal procedure according to the requirements set by the Graduate Division office. Upon advancement to candidacy for the degree, the faculty committee is then charged to guide the student in research and in the preparation of the dissertation.

## **8) Qualifying Examination Requirements:**

### *a) Qualifying Examination*

#### *i. General Information*

All students pursuing a Ph.D. degree are required to pass a qualifying examination before advancement to candidacy. The members of the student's Ph.D. committee will select one member to chair the examination committee. The dates for the examination are arranged between the student and the examination committee chair. The composition of the examination committee must be approved by the graduate dean. The qualifying exam may be taken only after the student's written research proposal has been approved, and the exam will focus on the student's research proposal, but may cover any related field of interest. The committee conducts the examination, and immediately thereafter evaluates the exam and informs the student of the outcome.

Four weeks before the Qualifying Examination, the student will provide to the Ph.D. committee a written *research proposal* that describes his/her research topic, summarizes progress to date, and outlines what he/she proposes to investigate, why it is relevant, and what will be learned. Guidelines about the format of the proposal will be established by the Ph.D. committee and will be communicated to the student by the graduate research advisor.

All students must complete their Qualifying Examination before becoming eligible for advancement to candidacy.

The Qualifying Examination should evaluate both general preparedness in the discipline, and specific competence to pursue the proposed dissertation topic. In its deliberation, the Committee ordinarily will review the student's academic record, preliminary examinations and evaluations by other faculty. The Committee may conduct any other examination it deems appropriate. The Committee ordinarily will review an outline of the proposed dissertation project, and will determine by oral examination the student's competence in that area. When, by unanimous vote, the Committee decides the student is qualified for the dissertation phase, it shall recommend advancement to candidacy to the Graduate Council via the Vice Provost and Dean of Graduate Education. Following its formal appointment, the Committee is free to adopt whatever procedures it deems appropriate to conduct the Qualifying Examination for candidacy, subject to the rules of the program and those specified below:

- Administration of the Candidacy Examination must conform to the policies established by the Graduate Council.
- The student must be given adequate notice of the content, form and time of the examination.
- The Committee must meet to decide upon the procedures to be followed, and the student given an opportunity to comment upon the selected procedures.

ii. *Conduct of the Exam*

The composition of the examination committee must be approved by the graduate dean. The qualifying exam may be taken only after the student's written research proposal has been approved (section 5.3), and the exam will focus on the student's research proposal, but may cover any related field of interest. The committee conducts the examination, and immediately thereafter evaluates the exam and informs the student of the outcome.

Although the formal Qualifying Examination for candidacy ordinarily is conducted in a single day, the Committee may meet intermittently over a longer period, and may decide to reexamine the student on one or more topics after a specified interval. When the Committee meets to conduct the oral Qualifying Examination, it must report to the Graduate Council via the Vice Provost and Dean of Graduate Education within 30 days. Upon completion of the qualifying examination and all other Graduate Group requirements for Advancement to Candidacy, the results should be submitted to the Graduate Division on the Qualifying Examination Report Form. The Qualifying Examination Report Form must be signed by all committee members at the time the candidacy examination is concluded and submitted even if the student failed the examination. Prior to convening a student committee for advancement to candidacy exam, the Faculty Advisor, the Graduate Group Chair, and the graduate student must sign the Statement on Conflict of Interest form that is included in the Advancement to Candidacy for the Degree of Doctor of Philosophy form. If the unanimous recommendation of the Committee is favorable, the student must pay the current advancement to candidacy fee to the campus Cashier's Office that will validate the advancement to candidacy form. The student must then submit the advancement to candidacy form to the Graduate Division. The candidate and graduate program will be notified of formal advancement and the appointment of a Doctoral Committee. Advancement to Candidacy begins with the first academic term following completion of all requirements (including submission of all forms)

iii. *Outcome of the Exam*

The committee conducts the examination, and immediately thereafter evaluates the exam and informs the student of the outcome. The committee members should include in their evaluations of the student such factors such as: relevant portions of the previous academic record, performance on the examination, and an overall evaluation of the student's potential for scholarly research as emerged during the examination. The final result of the examination is submitted in writing to the Graduate Division, according to the established procedures. Possible outcomes of the examination are:

- *Pass- A student has passed when the Qualifying Examination Committee unanimously votes that the student passed the entire examination with scholarship that is at least acceptable. The committee must report to the Graduate Council via the Vice Provost and Dean of Graduate Education within 30 days. If agreed unanimously by the committee the student may be allowed to make minor modifications prior to submitting the results of the examination.*
- *Fail- A student has failed when the Qualifying Examination Committee votes unanimously that the student failed the entire examination. The second examination may have a format different*

*from the first, but the substance should remain the same. A student whose performance on the second attempt is also unsatisfactory, or who does not undertake a second examination within a reasonable period of time, is subject to academic disqualification. A third examination may be given only with the approval of the Graduate Group committee and the Vice Provost and Dean of Graduate Education.*

- *Partial Pass- A student has partially passed when the Qualifying Examination Committee votes unanimously that the student passed some components but failed others. In this instance, the following apply:*
  - *The student has the option of taking a second examination as detailed in above on the components failed; and*
  - *The chair of the committee must write a letter to the student, with a copy to the Graduate Division, conveying the information about the student's performance (pass, fail, or partial pass) on each of the components covered during the examination.*

The committee should strive to reach a unanimous decision. If a unanimous decision is reached, the committee shall inform the student of its decision in one of the forms listed above. In those cases when it is not possible for the members to resolve their differences and reach a unanimous decision, the student should be informed of the nature of those differences and each member should submit a detailed assessment of the student's performance to the Graduate Council. The Council will use these individual reports to adjudicate the result.

As soon as a decision is reached, the committee shall inform the student of its decision in one of the forms listed above. If the decision is "Partial Pass" or "Fail", the chairperson of the committee must include in a report a specific statement, which may include a minority report, explaining the decision. In the case of a "Partial Pass" decision, the committee must include in its report a further statement of its terms and inform the student of those terms. Upon recommendation of the examination committee, a student who has not passed the examination may repeat the qualifying examination after a preparation time of no more than six months. The examination must be held by the same committee except that members may be replaced, with the approval of the graduate advisor and Graduate Dean, for cause such as extended absence from the campus. Failure to pass the examination on the second attempt means that the student is subject to disqualification from further study for the doctoral degree according to the policies established by the University of California. The Ph.D. Qualifying Examination is normally a closed event. Under exceptional circumstances one of the Ph.D. committee members may petition for an examination open to the general public. The final decision rests with the student. If the student agrees to have an open examination, the decision must be recorded in writing with the student's signature, and the signed document will be filed together with the report.

## **8) Dissertation Requirements:**

### ***a. Final Examination***

A final examination, the focus of which is the content of the doctoral dissertation, is required and the Doctoral Committee supervises this examination. Ordinarily, the final examination will be given just prior to the completion of the dissertation and

while the student is in residence during a regular academic session. Administration of the final examination is subject to the policies of the Graduate Council governing critical examinations. Upon completion of the final examination (if required) and approval of the dissertation, the Doctoral Committee recommends, by submission of the Report on Final Examination of the Ph.D. Degree Form, the conferral of the Ph.D. subject to final submission of the approved dissertation for deposit in the University Archives. The Committee recommendation must be unanimous.

Once the committee members are in agreement that the dissertation is ready to be defended (although minor deficiencies or matters of controversy may still exist), the final examination date may be scheduled by the student in consultation with the committee and the date must be reported to the Dean of Graduate Studies. The Ph.D. final examination consists of an open seminar on the dissertation work followed by a closed examination by the Ph.D. committee. During the examination, the student is expected to explain the significance of the dissertation research, justify the methods employed, and defend the conclusions reached. At the conclusion of the examination, the committee shall vote on whether both the written dissertation and the student's performance on the exam are of satisfactory quality to earn a University of California Ph.D. degree. The committee should strive to reach a unanimous decision. If a unanimous decision is reached, the committee shall inform the student of its decision in one of the forms listed above. In those cases when it is not possible for the members to resolve their differences and reach a unanimous decision, the student should be informed of the nature of those differences and each member should submit a detailed assessment of the student's performance to the Graduate Council. The Council will use these individual reports to adjudicate the result.

The members of the committee may vote to make passing the exam contingent on corrections and/or revisions to the dissertation. In this case, the committee will select one member, normally the graduate research advisor, who will be responsible for approving the final version of the dissertation that is submitted to Graduate Studies. All members of the Ph.D. committee must sign the final dissertation.

***b. General Requirements***

The submission of the dissertation is the last step in the program leading to the award of an advanced degree. All dissertations submitted in fulfillment of requirements for advanced degrees at UCM must conform to certain University regulations and specifications with regard to format and method of preparation. The UCM Thesis and Dissertation Manual are available at the Graduate Division website. The Doctoral Committee certifies that the completed dissertation is satisfactory through the signatures of all Committee members on the signature page of the completed dissertation. The doctoral committee chair is responsible for the content and final presentation of the manuscript.

Filing instructions are found in the UCM Thesis and Dissertation Manual. The advanced degree manuscript is expected to be submitted by the deadline in the semester in which the degree is to be conferred. The end of the semester is the deadline for submitting dissertations during each semester. Those students who complete requirements and submit dissertations after the end of the semester and prior to the start of the subsequent semester will earn a degree for the following semester, but will not be required to pay fees for that semester. In accordance with UC and UCM policy, all approved thesis/dissertation manuscripts automatically become available for public access and circulation as part of the UC Libraries collections.

***c. Dissertation***

The Ph.D. dissertation must be creative and independent work that can stand the test of

peer review. The dissertation reports a scholarly piece of work of publishable quality that solves a significant scientific problem in the field and is carried out under the supervision of a member of the program while the student is enrolled in the program. The work must be the student's, and it must be original and defensible. The student is encouraged to discuss with members of the Ph.D. committee both the substance and the preparation of the dissertation well in advance of the planned defense date. The student must provide a copy of the dissertation to each member of the faculty committee and allow each committee member at least four weeks to read and comment on it. If one or more committee members believe that there are significant errors or shortcomings in the dissertation or that the scope or nature of the work is not adequate, the student must address these shortcomings before scheduling a defense. Once the committee members are in agreement that the dissertation is ready to be defended (although minor deficiencies or matters of controversy may still exist), the final examination date may be scheduled by the student in consultation with the committee and the date must be reported to the Dean of Graduate Studies.

The dissertation must be approved and signed by the dissertation committee before it is submitted to Graduate Division for final approval.

- 9) Normative Time to Degree:** Normative Time is the elapsed time (calculated to the nearest semester) that students need to complete all requirements for the degree, assuming that they are engaged in full-time study and making adequate progress. There are two parts to Normative Time: Normative Time to Advancement to Candidacy and Normative Time in Candidacy. The first represents the number of semesters needed to complete all of course requirements and pass any required Qualifying Exams.

Normative Time for a Ph.D. degree in EECS is 5 years for students entering the Ph.D. program with a master's degree and 6 for those who pursue the Ph.D. directly after a bachelor's degree.

**10) Typical Timeline and Sequence of Events for a student with a MS degree**

<b><i>Year One</i></b>	<b><i>Fall</i></b>	<b><i>Spring</i></b>
	<i>Take 12 units of graduate work</i>	<i>Take 12 units of graduate work</i>
	<i>Register for 1 unit of EECS 290</i>	<i>Register for 1 unit of EECS 290</i>
<b><i>Year Two</i></b>	<b><i>Fall</i></b>	<b><i>Spring</i></b> ( <i>advancement to PhD candidacy</i> )
	<i>Take 12 units of graduate work</i>	<i>Defend Qualifying exam</i>
	<i>Qualifying Exam Preparation</i>	<i>Take 12 units of graduate work</i>
<b><i>Year Three</i></b>	<b><i>Fall</i></b>	<b><i>Spring</i></b>
	<i>Register for 12 units of graduate work</i>	<i>Register for 12 units of graduate work</i>
	<i>Register for 1 unit of EECS 290</i>	
<b><i>Year Four-Five</i></b>	<i>Dissertation</i>	

- 11) Sources of Funding:** Admission to EECS does not imply any form of financial support. However, a variety of fellowships and employment options are available on a competitive basis for selected



outstanding candidates. Employment possibilities for graduate students include Teaching Assistant (TA) positions, and Graduate Student Researcher (GSR) appointments. TA stipends and required qualifications are set by the school offering the position, while GSR stipends and required qualifications are determined by the faculty member offering the position. Graduate students pursuing a Ph.D. degree with external fellowships are still required to satisfy the one semester teaching requirement. Financial support provided through TA or GSR appointments is subject to periodic review and can be modified or revoked according to the appropriate regulations implemented at UC Merced.

Following advancement to candidacy, doctoral students who are not California residents will have their Nonresident Tuition reduced by 100 percent for a maximum of three consecutive calendar years. Any such student who continues to be enrolled or who re-enrolls after receiving the reduced fee for three years will be charged the full Nonresident Tuition that is in effect at that time.

- 12) Leaving the Program Prior to Completion of the PhD Requirements:** A student admitted for the Ph.D. degree, which, in the judgment of the unit's graduate affairs committee should not continue past the master's degree, must be notified in writing by the Graduate Group Chair of the Graduate Group offering the degree. A copy of the letter must be sent to the Vice Provost and Dean of Graduate Education. In some cases a doctoral student may choose to leave the program with a master's degree only. It is the responsibility of the Graduate Group unit to notify the Graduate Division via the Change of Degree form so that the student's record may be updated to reflect the student's degree status. This notice must include the student's written permission to have his/her degree objective changed officially from doctorate to master's.

#### **D. General Information**

**PELP, In Absentia and Filing Fee status.** Consistent with campus-wide policies, graduate students in EECS can apply for various types of leaves, including PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status. Information about PELP (Planned Educational Leave Program), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found in the Graduate Group Policies and Procedures Handbook available on Graduate Division.