Master’s and Ph.D. Degree Requirements
Graduate Group in Computer Science (GGCS)
University of California, Davis
Last Revised: Wednesday, April 25, 2012
Graduate Council Approval: May 18, 2012

Master’s Degree Requirements

Admissions requirements: Consideration for Master’s (M.S.) program admission requires completion of Graduate Studies’ online application, with fee payment, by the stated deadline. Admission requires a bachelor’s degree, three letters of recommendation, and a complete application form, including official transcripts, GRE scores, TOEFL scores or IELTS score (if applicable), a statement of purpose, and a personal history statement.

a) Prerequisites: In addition to the admission requirements stated above, applicants are expected to demonstrate proficiency at the undergraduate level in four fundamental areas of computer science and mathematics. The specified UCD courses exemplify the material:

- Computer Architecture: ECS154A
- Operating Systems: ECS150
- Programming Languages: ECS140A
- Theoretical Foundations: ECS120 (Theory of Computations) or ECS122A (Algorithm Design and Analysis)
- Mathematical Foundations: ECS132 or MAT135A or STA131A, and one additional upper-division mathematics course

These are referred to as the undergraduate proficiency requirements.

b) Deficiencies: Students may be admitted with one or more deficiencies in the undergraduate proficiency requirements. It is expected that the student will complete the undergraduate proficiency requirements by the end of the first academic year of residence. This deadline may be extended by approval of the Graduate Advisors Committee of the Graduate Group.

1) M.S. Plan I and Plan II
The Graduate Program of Computer Science offers two plans for the M.S. Degree with respective capstone requirements. Plan I requires successful completion of a thesis, while Plan II requires successful completion of either a project or a master’s exam. Students should decide, in consultation with graduate-group faculty, which option best suits their individual goals.

All options require 36 units of upper division and graduate coursework. At most 6 of these units may be from undergraduate courses. The following table summarizes specific requirements for the thesis, project, and exam options.
<table>
<thead>
<tr>
<th>Option</th>
<th>Requires</th>
<th>No. of graduate courses required</th>
<th>No. of ECS299 units allowed</th>
<th>Committee consists of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis</td>
<td>A written thesis</td>
<td>6</td>
<td>12</td>
<td>Thesis Advisor plus 2 more faculty members</td>
</tr>
<tr>
<td>Project</td>
<td>A project deliverable</td>
<td>7</td>
<td>8</td>
<td>Project Advisor plus 1 more member</td>
</tr>
<tr>
<td>Exam</td>
<td>Oral or written exams</td>
<td>9</td>
<td>4</td>
<td>Three faculty members</td>
</tr>
</tbody>
</table>

While ECS 299 units may be counted toward the required 36 units, up to the limits specified above, no other course numbered 290 or above may count towards the 36 units.

2) Course Requirements

The courses a student will use in satisfaction of the 36-unit course requirement must be approved by the student’s Thesis Advisor or Project Advisor, or by a Graduate Advisor.

A student must have a GPA of **3.0 or greater** for the M.S. degree to be awarded, and a **B or better** in all coursework used to satisfy the degree requirements.

Full-time students must enroll in a minimum of **12 units** per quarter. As per UC regulations, students may not enroll in more than 12 units of graduate level courses, nor more than 16 units of combined undergraduate and graduate level courses.

The **breadth requirement** requires the demonstration of proficiency at the graduate level in three of four specified areas: **Theory, Systems, Architecture, and Applications**. For each area, the student can demonstrate satisfaction of the breadth requirement in any of the following four ways:

1) Completing a Core course in the area with a grade of “B” or better.
2) After failing to get a “B” in a Core course, passing the Core Exam for that specific course.
3) Demonstrating that one has taken a similar graduate course at another institution and earned a grade of B or better. A Graduate Advisor must approve this option.
4) Challenging the Core course (“Credit by Examination”) as per UC procedures and receiving a grade of B or better. Information on this option can be found at URL http://registrar.ucdavis.edu/ucdwebcatalog/academicinfo/credit.html

The following list the Core classes in each of the four areas:
4) **Special requirements:** N/A

5) **Committees**

   a) **Admission Committee**

   Completed applications are evaluated by the Admissions Committee, with the assistance of other faculty in the Graduate Group. The Admissions Committee consists of six Graduate Group faculty. Based on a review of the entire application, a recommendation is made to accept or decline the applicant’s request for admission. The recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by Graduate Studies. Applications are accepted from September (when the admission system opens) through January 15 for the next Fall-entering class.
b) Graduate Advisors Committee

The Graduate Advisors Committee is composed of GGCS faculty members appointed by Graduate Studies. Every student who does not have a Thesis Advisor or Project Advisor will be assigned a Graduate Advisor from the Graduate Advisors Committee. Until a student has a Thesis Advisor or Project Advisor, the assigned Graduate Advisor will monitor the progress of the student and provide guidance on his/her academic program. Each GGCS graduate student is responsible for meeting with his or her Graduate Advisor at least once per quarter.

c) Thesis Committee

The student’s Thesis Advisor, in consultation with the student, nominates two additional GGCS faculty members to serve on the Thesis Committee. These nominations are submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy. The Thesis Advisor serves as Chair of the Thesis Committee. At least two members of this committee must be members of the Academic Senate of the University of California, and a least two members of this committee must be GGCS members. The thesis must be approved by all three members of the Thesis Committee.

d) Project Committee

The student’s Project Advisor nominates one additional faculty member to serve on the Project Committee. This nomination is submitted to the Graduate Advisors Committee for approval. The responsibility of the Project Committee is to supervise and evaluate the student’s project. A project must be approved by both members of the committee.

e) Master’s Exam Committee

For students taking the Master’s Exam, the Graduate Advisors Committee, after consultation with the student, nominates three faculty members to serve on the Master’s Exam Committee. The majority of this committee must be GGCS members. The responsibility of this committee is to give the Master’s Exam. The format of the exam is described in Section 8(c).

6) Advising Structure and Mentoring

A student’s Thesis Advisor or Project Advisor supervises his/her thesis or project, and serves as Chair of the corresponding committee. A student’s Graduate Advisor serves as a resource for information on academic requirements, policies, and procedures in the absence of a Thesis Advisor or Project Advisor. The Graduate Program Coordinator assists students with appointments, requirements, university policies, and in identifying a Thesis Advisor or Project Advisor. The Mentoring Guidelines can be found in the graduate student handbook at http://www.cs.ucdavis.edu/graduate/currentgrads.html

7) Advancement to Candidacy

After completing at least one-half the course requirements for the degree, a student must file an application for Advancement to Candidacy. A student must file for candidacy at least one full quarter before completion of all degree requirements and before going on filing fee status. The Candidacy for the Degree of Master form can be found online at: http://www.gradstudies.ucdavis.edu/forms. A completed form includes a list of courses
the student will take to complete degree requirements. Students must have their Thesis Advisor, Project Advisor, or Graduate Advisor sign the candidacy form. If the candidacy is approved, the Office of Graduate Studies will send a copy to the student, his Thesis, Project, or Graduate Advisor, and the Graduate Program Coordinator. If the Office of Graduate Studies determines that a student is not eligible for advancement, the GGCS and the student will be told the reasons for the application’s deferral. Some reasons for deferring an application include a grade point average below 3.0, outstanding “I” grades in required courses, or insufficient units.

If changes must be made to the student’s course plan after s/he has advanced to candidacy, a Graduate Adviser must recommend these changes to Graduate Studies.

8) Requirements for the Thesis, Project, and Master’s Examination:

a) Thesis

Research for the Master’s thesis is to be carried out under the supervision of a GGCS faculty member of and must represent an original contribution to knowledge in the field. A Master’s thesis is usually based on 6 to 12 units of research carried out under the 299 course number. The thesis should demonstrate the student’s proficiency in research methods and scientific analysis, and a thorough knowledge of the state of the art in the student’s chosen area. A Master’s thesis is a description of an original technical or research contribution of limited scope, or an advanced design study. The thesis research must be conducted while the student is enrolled in the program. The thesis is submitted to the Thesis Committee at least one month before the student plans to make requested revisions. All Thesis Committee members must approve the thesis and sign the title page before the thesis is submitted to Graduate Studies for final approval. Should the committee determine that the thesis is unacceptable, even with substantial revisions, the program may recommend the student for disqualification from the program to the Dean of Graduate Studies.

The student and Thesis Advisor must meet at least once a quarter with the other two members of the Thesis Committee to discuss progress and any changes in research objectives.

The thesis must be filed in a quarter in which the student is registered or on filing fee. Instructions on preparation of the thesis and a schedule of dates for filing the thesis in final form are available from Graduate Studies; the dates are also printed in the UC Davis General Catalog and in the Class Schedule and Registration Guide issued each quarter.

b) Project

A project is carried out under the supervision of the faculty member who serves as Project Advisor. The topic and extent of the project is determined by the faculty member in consultation with the student. A typical project involves the practical solution (implementation) of a software system or an experimental study of a computer hardware/software design. The Project Committee specifies the project requirements,
which may include the delivery of a software prototype system, an interactive demonstration, a written report, and/or an oral presentation of the study. All committee members must approve the project. The Master’s Report Form is then signed by the Thesis Adviser and forwarded to the Office of Graduate Studies. Should the Project Committee determine that the project outcome is unacceptable, the program may recommend the student for disqualification from the program to the Dean of Graduate Studies.

c) Master’s Examination

The examination is used to ensure that the student has acquired proficient knowledge in core and applied CS areas. The examination may be oral, written, or a combination of both, designated by the Exam Committee, with the objective to strengthen the student’s knowledge in selected core or applied CS areas that can best prepare the student for his/her professional career.

The examination may be taken once the student has completed required courses and advanced to candidacy. However, it is important that the timing of the exam satisfy the regulations as noted in the CCGA handbook, which indicates that the capstone requirement be completed at or near the end of the coursework for the Master’s degree. A student is allowed to repeat the Master’s Examination only once. After passing the examination, a copy of the Master’s Report Form (which can be found at http://www.gradstudies.ucdavis.edu/forms) is signed by a GGCS Graduate Adviser and then forwarded to the Office of Graduate Studies. The deadlines for completing this requirement are listed each quarter in the campus General Catalog (available online at the website of the Office of the Registrar or from the Bookstore).

If a student does not pass the exam on the first attempt, the Exam Committee may recommend that the student be reexamined one more time, but only if the Graduate Adviser Committee concurs with the Exam Committee. The examination may not be repeated more than once, and the student is not allowed to retake the exam on a different topic area or in a different category (i.e., switching to Project or Thesis). The Exam Committee provides information concerning the timing and format of a second exam if a student must retake the exam after failing part or the entire first exam. Please note that Graduate Studies requires the Exam Committee’s unanimous vote to pass a student on the exam. A student who does not pass on the second attempt will be recommended for disqualification from further graduate work in the program to the Dean of Graduate Studies.

For either Project or Examination, a candidate must be a registered student or on filing fee status at the time the program submits the form, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter. The Graduate Group must file the Form with Graduate Studies within one week of the end of the quarter in which the student’s degree will be conferred.

9) Normative Time to Degree

Plan I It is expected that the student will complete the breadth requirements within the first four quarters of residence. It is expected that the student will complete the M.S.

1 Appendix K, page 34, of http://www.universityofcalifornia.edu/senate/committees/ccga/ccgahandbook.pdf
Degree by the end of the seventh (7) quarter of residence, including all course requirements and the approval of the thesis. These deadlines may be extended only by approval of the Graduate Advisors Committee of the Graduate Group.

Plan II  It is expected that the student will complete the breadth requirements within the first four (4) quarters of residence. It is expected that the student will complete all course work and project/examinations by the end of the sixth (6th) quarter of residence.

These deadlines may be extended only by approval of the Graduate Advisors Committee of the Graduate Group.

10) Typical Time Line and Sequences of Events

<table>
<thead>
<tr>
<th>Thesis</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECS201A, ECS235A, ECS299</td>
<td>ECS299; advancement to candidacy</td>
</tr>
<tr>
<td>Winter</td>
<td>ECS222A, ECS240, ECS299</td>
<td>ECS299</td>
</tr>
<tr>
<td>Spring</td>
<td>ECS265, ECS244, ECS299</td>
<td>ECS299; thesis completed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECS201A, ECS275</td>
<td>ECS260; ECS299</td>
</tr>
<tr>
<td>Winter</td>
<td>ECS222A, ECS272</td>
<td>ECS299; advance to candidacy; project completed</td>
</tr>
<tr>
<td>Spring</td>
<td>ECS226, ECS277</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exam</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ECS201A; ECS260</td>
<td>ECS235A; ECS252</td>
</tr>
<tr>
<td>Winter</td>
<td>ECS222A; ECS240</td>
<td>ECS299; advancement to candidacy; exam passed</td>
</tr>
<tr>
<td>Spring</td>
<td>ECS265; ECS244</td>
<td></td>
</tr>
</tbody>
</table>

Note that these samples do not take into account the student’s possible need of fulfilling undergraduate proficiency requirements. Depending on the added workload, the student may need additional quarters to complete the exam/project/thesis.

11) Sources of funding

Financial assistance for graduate study comes in the form of fellowships, Teaching Assistant (TA) and Graduate Student Research (GSR) positions.

12) PELP, In Absentia and Filing Fee status

Information about PELP (Planned Educational Leave), In Absentia (reduced fees when conducting research out of California), and Filing Fee status can be found in the Graduate Student Guide: http://www.gradstudies.ucdavis.edu/publications
Ph.D. Degree Requirements

1) **Admissions requirements:** Consideration for admission requires completion of Graduate Studies’ online application, with fee payment, by the stated deadline. Admission requires a bachelor’s degree, three letters of recommendation, and a complete application form, including official transcripts, GRE scores, TOEFL scores or IELTS score (if applicable), a statement of purpose, and a personal history statement.

(a) **Prerequisites:** In addition to the admission requirements stated above, applicants are expected to demonstrate proficiency at the undergraduate level in four fundamental areas of computer science and mathematics. The specified UCD courses exemplify the material:

<table>
<thead>
<tr>
<th>Category</th>
<th>Course Code (UCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Architecture</td>
<td>ECS154A</td>
</tr>
<tr>
<td>Operating Systems</td>
<td>ECS150</td>
</tr>
<tr>
<td>Programming Languages</td>
<td>ECS140A</td>
</tr>
<tr>
<td>Theoretical Foundations</td>
<td>ECS120 (Theory of Computations) or ECS122A (Algorithm Design and Analysis)</td>
</tr>
<tr>
<td>Mathematical Foundations</td>
<td>ECS132 or MAT135A or STA131A, and one additional upper-division mathematics course.</td>
</tr>
</tbody>
</table>

These are referred to as the *undergraduate proficiency requirements*.

(b) **Deficiencies:** Students may be admitted with one or more deficiencies in the undergraduate proficiency requirements. It is expected that the student will complete the undergraduate proficiency requirements by the end of the first academic year of residence. This deadline may be extended by approval of the Graduate Advisors Committee of the Graduate Group.

2) **Dissertation Plan**

GGCS offers **Plan B** as described under Section 520 in the Davis Division Academic Senate Regulations. Plan B specifies a three member (minimum) dissertation committee, an optional final oral examination (made on an individual student basis by the dissertation committee), and an exit seminar.

3) **Advanced Proficiency Requirements**

All students who are in the Ph.D. program, or who expect to work toward a doctorate in computer science at UC Davis, are required to complete the Advanced Proficiency requirement. A student passes this requirement by a high level of achievement in graduate coursework and demonstrating “advanced” proficiency in the graduate breadth requirements. The GGCS breadth requirement includes demonstrated proficiency in four areas of computer science at the graduate level: Theory, Systems, Architecture, and Applications. The student can satisfy the above requirements in one of the following ways:

1) Completion of a Core course with a grade of “A-” or better.
2) After failing to get an “A-” in a Core course, passing the Core Exam for that specific course.
3) Demonstration that one has taken a similar graduate course at another institution with a grade of A- or better. A Graduate Advisor must approve this option.
4) Challenging the Core course ("Credit by Examination) as per UC procedures (http://registrar.ucdavis.edu/ucdwebcatalog/academicinfo/credit.html), receiving a grade of A- or better. Information on this option can be found at URL http://registrar.ucdavis.edu/ucdwebcatalog/academicinfo/credit.html

a) Core Courses (45 units) (Breadth Requirements)

Architect Core
ECS 201A Advanced Computer Architecture 4 units
EEC 270 Computer Architecture 4 units

Systems Core
ECS 240 Programming Languages 4 units
ECS 251 Operating Systems 4 units
ECS 260 Software Engineering 4 units

Theory Core
ECS 222A Design and Analysis of Algorithms 4 units
ECS 220 Theory of Computation 4 units

Applications Core
ECS 230 Applied Numerical Linear Algebra 4 units
ECS 231 Large Scale Scientific Computation 4 units
ECS 234 Computational Functional Genomics 4 units
ECS 235A Computer and Information Security 4 units
ECS 236 Computer Security Intrusion Detection Based Approach 4 units
ECS 252 Computer Networks 4 units
ECS 256 Performance Evaluation 4 units
ECS 265 Database Systems 4 units
ECS 267 Wide-Area Distributed Information Systems 4 units
ECS 268 Scientific Data and Workflow Management 4 units
ECS 270 Artificial Intelligence 4 units
ECS 271 Machine Learning & Discovery 4 units
ECS 272 Information Visualization 4 units
ECS 274 Automated Deduction 4 units
ECS 275A Advanced Computer Graphics 4 units
ECS 276 Advanced Volume Visualization 4 units
ECS 277 Advanced Visualization 4 units
ECS 278 Computer Aided Geometric Design 4 units
ECS 279 Computer Animation 4 units

b) Summary: 45 units of upper division and graduate coursework are required. Full-time students must enroll for 12 units per quarter including research, academic and seminar units. Per UC regulations students cannot enroll in more than 12 units of graduate level courses (200) or more than 16 units of combined undergraduate and graduate level (100, 200, 300) courses per quarter.
4) **Special Requirements:** The Graduate Group requires all Ph.D. candidates demonstrate at least one quarter of college level teaching experience. We strongly recommend that this includes lecturing or leading a discussion section. In addition, each student is required to participate in an exit seminar, in which the research is presented to the UC Davis academic community. This seminar will be administered by the dissertation committee and will take place after all committee members have approved the dissertation, but before the dissertation has been filed with the Office of Graduate Studies.

5) **Committees**

a) **Admissions Committee**  Completed applications are evaluated by the Admissions Committee, with the assistance of other faculty in the Graduate Group. The Admissions Committee consists of six Graduate Group faculty. Based on a review of the entire application, a recommendation is made to accept or decline the applicant’s request for admission. The recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by Graduate Studies. Applications are accepted from September (when the admission system opens) through January 15 for the next Fall-entering class.

b) **Graduate Advisors Committee**  The Graduate Advisors Committee is composed of GGCS faculty members appointed by Graduate Studies. Every student who does not have a Dissertation Advisor will be assigned a Graduate Advisor from the Graduate Advisors Committee. Until a student has a Dissertation Advisor, the assigned Graduate Advisor will monitor the progress of the student and provide guidance on his/her academic program. Each GGCS graduate student is responsible for meeting with his or her Graduate Advisor at least once per quarter.

c) **Qualifying Examination Committee**  The student, in consultation with his/her Dissertation Advisor, nominate five faculty members to serve on the Examination Committee. The Dissertation Advisor must be selected before the Qualifying Examination Committee is formed. The Dissertation Advisor must be on the qualifying exam committee but cannot be chair of the committee. The membership of the Qualifying Exam Committee must satisfy the following conditions: The chair of the committee must be a member of the Academic Senate of UC Davis, and a GGCS member. At least three members of the committee must be members of the Academic Senate of the University of California and GGCS members. It is recommended (by the Academic Senate) that one member of the committee be a faculty member outside of the Graduate Group in Computer Science. These nominations are submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy. The Qualifying Exam Committee conducts the exam and submits results to the Office of Graduate Studies.

d) **Dissertation Committee**

The Dissertation Committee consists of three members who will guide the student in research. Graduate Studies must approve this committee. Guidelines for choosing the members of the dissertation committee are as follows. At least two of the members must be members of the Academic Senate of the University of California. At least two of these members must be members of the Graduate Group in Computer Science. The Chair of this committee must be a member of the Graduate Group in Computer Science. The
Chair of the Dissertation Committee is the student’s Dissertation Advisor. The composition of the dissertation committee is entered on the Advancement to Candidacy Form.

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 Committee Chairperson, the Dissertation Advisor, should determine the desires of the individual members regarding assistance with the research and dissertation review at the time the Dissertation Committee is constituted. Students are expected to meet with their Dissertation Advisor at least quarterly. Dissertation committee members are expected to read and comment on a dissertation within four weeks from its submission. This time limit policy does not apply to summer periods for faculty holding nine-month appointments. The student and faculty will coordinate a timeline for the student to present the thesis to the dissertation committee. This timeline must allow all dissertation committee members enough time to fulfill their responsibilities within the four-week deadline.

6) Advising Structure and Mentoring

A student’s Dissertation Advisor supervises his/her thesis or project, and serves as Chair of the Dissertation Committee. A student’s Graduate Advisor serves as a resource for information on academic requirements, policies, and procedures in the absence of a Dissertation Advisor. The Graduate Program Coordinator assists students with appointments, requirements, university policies, and in identifying a Dissertation Advisor. Mentoring Guidelines can be found at http://www.cs.ucdavis.edu/graduate/currentgrads.html

7) Advancement to Candidacy

Before advancing to candidacy for a doctoral degree, a student must have satisfied all requirements set by the graduate program, must have maintained a minimum GPA of 3.5 in all coursework undertaken (except those courses graded S or U), and must have passed the Qualifying Examination before a committee appointed to administer it. Normally, students advance to candidacy by the end of their 9th quarter; students must pass their QE by the end of the ninth quarter in order to remain eligible for academic appointments (TA, GSR, AI, etc.). The student must file the appropriate paperwork with the Office of Graduate Studies and pay the candidacy fee in order to be officially promoted to Ph.D. Candidacy. Refer to the Graduate Council website for additional details regarding the Doctoral Qualifying Examination at http://gradstudies.ucdavis.edu/gradcouncil/policiesall.html

8) Qualifying Examination and Dissertation requirements

a) Qualifying Examination

(i) General information To be eligible for the Qualifying Examination, the student must have satisfied all course requirements, have removed all undergraduate deficiencies, and must have at least a 3.5 GPA in courses taken in the program of study. Passing this exam makes the student eligible for advancement to candidacy. The Qualifying Exam should be taken by the ninth quarter and no later than the end of the fifteenth quarter after admission to the Ph.D. program.

The primary purpose of the Qualifying Examination is to validate that the student is
academically qualified to conceptualize a research topic, undertake scholarly research, and successfully produce the dissertation required for a doctoral degree. The Qualifying Exam must evaluate the student’s command of the field, ensuring that the student has both breadth and depth of knowledge. It must not focus solely on the proposed dissertation research. In addition, the Qualifying Exam provides an opportunity for the committee to provide important guidance to the student regarding his or her chosen research topic. The Qualifying Examination is a formal, oral examination to ascertain the student’s readiness to conduct Ph.D.-level research in the major area of study.

(ii) Written portion of the qualifying exam: the Dissertation Proposal

Prior to the Qualifying Examination the student must prepare a Dissertation Proposal containing a thorough discussion of a proposed thesis topic. This paper must be submitted to the Qualifying Examination Committee at least two weeks prior to the examination. The Dissertation Proposal is an independently prepared proposal describing the student’s dissertation-specific research aims, hypotheses, progress to date, and experimental approach. Concepts within the research proposal can be discussed with others (such as the student’s Dissertation Advisor and peers), but the writing of the proposal should be solely the student’s work, as the proposal will also serve as evidence of the student’s proficiency in scientific writing. The Qualifying Exam Committee is responsible for assessing that the student’s scholarly preparation and writing proficiency are satisfactory before advancement to candidacy. Furthermore, the Dissertation Proposal will provide information that may be discussed during the oral exam.

(iii) Oral portion of the exam

The oral portion of the qualifying exam will be 2-3 hours in length. The examinations differ in structure, depending on the area of research and the members of the examining committee. The student will be asked to give a formal presentation of the dissertation proposal. The committee will question the student on this proposal, and will question the student to determine the student’s competence in both the major and minor areas of study.

The committee will evaluate the student’s general qualifications for a position in academia or in industry, the student’s preparation in his/her specific area of study, the student’s previous academic record, performance on specific parts of the examination, and the student’s potential for scholarly research as indicated during the examination and in the student’s publication history.

(iv) Outcome of the exam

The committee can issue any of the following grades for the examination:

Pass – In this case student can apply to the Graduate Studies for Advancement to Candidacy for the degree. At this time a dissertation committee is officially selected to direct the student in the research, and to guide the student in the preparation of the dissertation. The committee must be approved by Graduate Studies.

Not Pass – In this case, the committee has two options:

1. It can decide that the student’s Dissertation Proposal is not sufficient and ask that it be re-thought or re-written. In this case, the committee will ask the student to remedy the
problems in the proposal and retake the examination within a specified time frame.

2. It can decide that the student’s knowledge within the major and minor areas is not sufficient for continued progress for the Ph.D. In this case, the committee can ask the student to take some additional coursework and retake the examination within a specified time frame.

**Fail** – In this case, the student is not permitted to continue in the Ph.D. program.

The student can only retake the Qualifying Examination once. If a passing grade is not achieved by the second attempt, the student cannot continue in the Ph.D. program.

If a unanimous decision takes the form of “Not Pass” or “Fail”, the Chair of the Qualifying Exam Committee must include in its report a specific statement, agreed to by all members of the committee, explaining its decision, the Chair must inform the student of its decision. Having received a “Not Pass” the student may attempt the Qualifying Exam one additional time; the Qualifying Exam report must list the specific conditions and timing for the second exam. After a second examination, a vote of “Not Pass” is unacceptable; only “Pass” or “Fail” is recognized. Should the student receive a “Fail” on the first or second attempt at the exam, the student will be recommended for disqualification from the program to the Dean of Graduate Studies.

**b. The Dissertation**

(i) **General requirements**

The Ph.D. dissertation demonstrates the ability of the student to carry out an independent original research project of high quality. It reflects a level of attainment in research, not the fulfillment of a list of requirements. An acceptable Ph.D. dissertation is not only an original contribution to the field, but is generally characterized by a broad scope of applicability. The dissertation must be submitted to each member of the dissertation committee at least one month before the student expects to make requested revisions; committee members are expected to respond within four weeks, not including summer months for nine-month faculty. Informing committee members of progress as writing proceeds helps the members to plan to read the dissertation and provide feedback within this timeframe. The dissertation must be approved and signed by all members of the Dissertation Committee before it is submitted to Graduate Studies for final approval.

Filing of the Dissertation with the Office of Graduate Studies is normally the last requirement satisfied by the candidate. The deadlines for completing this requirement are listed each quarter in the campus General Catalog (available online at the website of the Office of the Registrar or from the Bookstore). A candidate must be a registered student or on Filing Fee status at the time of filing a dissertation, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter. The Dissertation will be prepared, submitted and filed according to regulations instituted by the Office of Graduate Studies [http://gradstudies.ucdavis.edu/students/filing.html](http://gradstudies.ucdavis.edu/students/filing.html). Satisfaction of this requirement must be verified by the Dissertation Committee Chair.
(ii) Exit Seminar
Each student is required to participate in an Exit Seminar, in which the candidate’s research is presented to the UC Davis academic community. This seminar will be administered by the Dissertation Committee and will take place after all committee members have approved the dissertation, but before the dissertation has been filed with the Office of Graduate Studies. Adequate scheduling of the Exit Seminar is the responsibility of the student.

9) Normative Time to Degree

It is expected that the student will complete the undergraduate proficiency requirements within the first four quarters of study, the Advanced Proficiency within the first six quarters of study, and the Qualifying Examination between the sixth and ninth quarters of study. Completion of all requirements is normally accomplished in fifteen quarters of study. The maximal time period allowed for completion of each requirement is as follows.

A student’s Program of Study must be submitted and approved by the end of four quarters of study. The student must complete the Advanced Proficiency Requirements by the end of the sixth quarter of study. The student must complete the Qualifying Examination by the end of the ninth quarter of study. The student should complete all requirements for the Ph.D. by the end of the 15th quarter of study.

Students who fail to complete all the requirements within the “normal” time period are referred to the Educational Policy Committee of the Graduate Group. The Committee considers the student’s entire record, including examination scores and letters of support, particularly from the student’s Thesis Advisor. The Committee exercises wide discretion: it may decide that no action is necessary; that the student should be allowed more time in which to complete the requirement; that certain of the requirements should be waived; that certain remedial actions should be taken; or that the student should be advised to leave the program. The committee attaches great weight to the Thesis Advisor’s letter of support. It is therefore extremely important that students involve themselves in research under some faculty member early in the program—preferably by the end of their third quarter.
10) **Typical Time Line**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year One</td>
<td>ECS 201A Advanced Computer Architecture</td>
<td>ECS 259 Optical Networks</td>
<td>ECS 252 Computer Networks</td>
</tr>
<tr>
<td></td>
<td>ECS 235A Computers and Information Security</td>
<td>ECS 222A Design and Analysis of Algorithms</td>
<td>ECS 251 Operating System Models</td>
</tr>
<tr>
<td></td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
</tr>
<tr>
<td>Year Two</td>
<td>Fall (Program of Study submitted and approved)</td>
<td>Winter (Advanced Proficiency Requirements completed)</td>
<td>Spring (Application for Qualifying Examination)</td>
</tr>
<tr>
<td></td>
<td>ECS 256 Performance Evaluation</td>
<td>ECS 240 Programming Languages</td>
<td>ECS 299 Research</td>
</tr>
<tr>
<td></td>
<td>ECS 289F Finite Model Theory</td>
<td>ECS 244 Concurrent Programming</td>
<td>ECS 299 Research</td>
</tr>
<tr>
<td></td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
</tr>
<tr>
<td>Year Three</td>
<td>Fall (advancement to PhD Candidacy)</td>
<td>Winter</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
<td>ECS 299 Research</td>
</tr>
<tr>
<td></td>
<td>Qualifying Examination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years Four – Six</td>
<td>ECS Research Units. Dissertation Research Completion. Exit Seminar Completion.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11) **Sources of Funding**

Financial assistance for graduate study comes in the form of fellowships, Teaching Assistantships (TA), and Graduate Student Research (GSR) positions. The standard form of Ph.D. graduate student support in a 50% TA position for the first three quarters and either a 50% TA or 45% GSR position for the remainder of a student’s academic career. The amount and type of aid that the department can offer varies from year to year depending on the number of TA and GSR positions that are available, the fellowships that the department is authorized to award, and the number of students requesting financial assistance. We strongly encourage all qualified applicants to apply for many external fellowships offered by both government and private agencies.

12) **PELP, In Absentia and Filing Fee Status**

Information about PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found in the Graduate Student Guide: http://www.gradstudies.ucdavis.edu/publications/

13) **Leaving the Program Prior to Completion of the PhD Requirements**
Should a student leave the program prior to completing the requirements for the Ph.D., he or she may still be eligible to receive the Master’s Degree if they have fulfilled all the requirements. Students use the Change of Degree Objective form available at URL http://registrar.ucdavis.edu/PDFFiles/D065PetitionForChangeOfGraduateMajor.pdf