



Environmental
Systems Graduate Program Handbook

University of California, Merced



Table of Contents

Section 1: Introduction

Section 2: Administration and Logistics

- 2.1 Organization
- 2.2 Key People to know

Section 3: Advising and Mentoring

- 3.1 How to Choose a Major Advisor
- 3.2 Forming your Faculty Committee
- 3.3 Annual Student Evaluations
- 3.4 Graduate Support Staff
- 3.5 University Resources

Section 4: The Ph.D. Degree Program

- 4.1 Program Learning Outcomes
- 4.2 Residency Requirements
- 4.3 Coursework Requirements
- 4.4 Satisfactory Progress
- 4.5 Advancement to Candidacy
- 4.6 Qualifying Exam
- 4.7 Research Proposal
- 4.8 Lapse of Candidacy
- 4.9 Dissertation and Defense
- 4.10 Expected Time to Degree

Section 5: The M.S. Degree Program

- 5.1 Program Learning Outcomes
- 5.2 Residency Requirements
- 5.3 Coursework Requirements
- 5.4 Satisfactory Progress
- 5.5 Advancement to Candidacy
- 5.6 Thesis and Defense
- 5.7 Expected Time to Degree

Section 6: Tips and Resources for Success

- 6.1 Professional Development
- 6.2 TA Resources
- 6.3 Writing Resources
- 6.4 Mentorship Resources

Section 1: Introduction

Welcome to the Environmental Systems Graduate Program!

The Environmental Systems (ES) graduate degree program was established to explicitly address the interdisciplinary environmental challenges associated with changing climate and resource sustainability in the 21st century. Solutions to these complex problems require integrated research between science and engineering, and implementation using related research in management, economics, and policy. The ES program is intended to circumvent barriers created by traditional academic departments and to foster innovative, transdisciplinary research in environmental and sustainable systems.

Environmental Systems was started as an individual graduate program at UC Merced in 2004. In 2007, it was the first graduate program at Merced to receive approval systemwide from the University of California to award Ph.D. and M.S. degrees. As part of the approval process, ES faculty developed the requirements for earning the Ph.D. or M.S. degree, and established the group's initial bylaws, policies, and procedures for administering the graduate program. These policies and procedures are updated occasionally by faculty to reflect changes in the program and the university as we continue to grow and develop.

This handbook is intended for students, faculty, and staff as a quick guide to requirements, policies, and resources that are specific to the ES program. It is a supplement to the UC Merced Graduate Advisors Handbook, which covers policies for the Merced campus. All requirements of the ES program, and those of graduate programs at UC campuses in general, must adhere to University of California systemwide regulations and policies.

Graduate study is different from earning an undergraduate degree! The expectations and rewards of graduate study are distinct from earlier stages of education. Graduate students are expected to exhibit a higher degree of independence, and develop relationships with advisors and other scientists that begin to shift toward that of colleagues as much or more than teacher-to-pupil. Students should:

- Take ownership of your research, program of study, teaching, and professional development
- Ask questions and seek the advice of many faculty, not just your primary advisor
- Seek your own sources of funding and financial support, both within and external to the university
- Take advantage of campus, community, and professional resources
- Network with fellow students and learn from their experiences
- Be organized, don't miss deadlines, ask staff for help
- Communicate with your advisor and degree committee regularly
- Learn to work and think both independently and collaboratively

The faculty and staff wish you the best in your graduate studies!

Peggy O'Day
Environmental Systems Graduate Group Chair, 2013-2016
August 2016

Acknowledgements

Many thanks to Angela Krueger (Office of Program Review, Assessment and Accreditation Support) for assistance in preparing this handbook and to the Environmental Systems students and faculty for helpful comments and suggestions.

Mission Statement

THE ENVIRONMENTAL SYSTEMS GRADUATE PROGRAM focuses on understanding the Earth as an integrated system that includes the atmosphere, hydrosphere, lithosphere, and biosphere in order to address the environmental consequences and develop sustainable solutions to providing food, energy, and other basic services to the Earth's ever-growing population. Recognizing that solutions to local, regional, and global environmental problems cross traditional academic departments, domain knowledge is complemented by an interdisciplinary shared curriculum that provides a foundation in the fundamental ideas and methods of the earth, environmental and social sciences. Environmental Systems faculty, staff and students are dedicated to excellence in teaching, research and service, and strive to develop an atmosphere of transparency, inclusiveness, rigor, integrity, and environmental awareness.

Section 2: Administration and Logistics

2.1 Graduate groups are different...

The ES program is a graduate degree program of the University of California (UC). Unlike undergraduate programs in UC that are awarded by individual campuses (called "Divisions" of UC), graduate degrees across UC are approved systemwide and awarded from the University of California system. Our academic organization at UC Merced was established with traditional Schools of Engineering and Natural Sciences for the delivery of undergraduate degree programs. Following the graduate program structure at UC Davis, Merced chose to establish "graduate groups" for graduate degrees – groups that sit administratively outside of the formal schools or departments that can be joined by faculty with common research or disciplinary interests. The graduate group model was intended to provide flexibility and innovation in graduate degrees and, for the ES program, enabled faculty in science and engineering to establish a single graduate program spanning schools. As UC Merced has grown, some graduate groups have aligned with undergraduate programs and faculty in more traditional academic departments, while other graduate groups such as ES continue to span across faculty units and schools.

The administration of the ES program is through the School of Engineering (SOE) and its dean, and academic support and staff are administered through the SOE. The SOE graduate staff is the first line of inquiry for any administrative or logistical questions. The Graduate Division is responsible for administration of all graduate degree programs at UC Merced and provides a variety of support services and resources for graduate students (see links below). The majority of ES faculty are in the Schools of Engineering and Natural Sciences, with a few affiliated with Social Sciences, Humanities and Arts (SSHA). Many ES faculty have an affiliation with another graduate group and mentor students in both groups. Students and faculty in the ES program are housed mostly on campus in Science and Engineering buildings 1 and 2 (SE1, SE2), with some students located in the Social Sciences and Management (SSM) building or at the Castle research site (11 miles from campus). Students in ES are generally assigned a desk space in one of these locations. Access to laboratories and other research space is granted as a

student joins a faculty group and begins work on his or her research. In general, students in the ES program are financially supported during their tenure, usually through a combination of teaching assistantships (TAs), institutional or external fellowships, and graduate student research (GSRs) assistantships on individual faculty grants as long as they remain in good academic standing and are making progress towards their degree within the expected time frame (see below).

2.2 People to Know

Useful People to Know:

- ES Graduate Group Chair and faculty Executive Committee members
- Faculty members of the ES Advising Committee
- ES Program Coordinator, School of Engineering
- Deans: Schools of Engineering, Natural Sciences, Social Sciences, Humanities, & Arts
- Graduate Division Staff and Dean
- ES Student Representatives
- Graduate Student Association Student Leaders

2016-2017

ES Graduate Group Chair: Marc Beutel (mbeutel@ucmerced.edu)

Executive Committee Members: Tom Harmon (tharmon@ucmerced.edu), Elliott Campbell (ecampbell3@ucmerced.edu)

ES Advising Committee: Danielle Edwards (dedwards5@ucmerced.edu), Peggy O'Day (poday@ucmerced.edu)

Graduate Program Services, School of Engineering:

Tomiko Hale (Thale2@ucmerced.edu)
Assistant Director, Graduate Program Services

Tamika “Meka” Hankston (thankston2@ucmerced.edu)
Advisor, Graduate Program Services

School Deans

Mark Matsumoto (mmatsumoto@ucmerced.edu)
Dean, School of Engineering

Juan Meza (jcmeza@ucmerced.edu)
Dean, School of Natural Sciences

Jill Robbins
Dean, School of Social Sciences, Humanities and Arts
jillrobbins@ucmerced.edu

Graduate Division Staff

Marjorie Zatz (mzatz@ucmerced.edu)
Vice Provost and Dean for Graduate Education

Tsu Ya (tya@ucmerced.edu)
Director of Graduate Admissions and Academic Services

Eric Cannon (Ecannon2@ucmerced.edu)
Graduate Student Support Manager (funding and financial aid)

Graduate Student Association Leaders

John Bunce (jbunce@ucmerced.edu)
President, 2016-17
Psychological Sciences Ph.D. Candidate

Matthew Jian (mjian@ucmerced.edu)
ES Student Representative

Section 3: Advising and Mentoring

3.1 Choosing Your Major Professor

A student's major professor is their primary advisor. Together, the student and the major professor will determine a significant research topic for the student's dissertation or thesis, and develop a plan of study for the student's intellectual and professional development. Research will normally occupy a majority of the student's time after the first year or two of residence. As such, the relationship between the student and their major professor is a critical component of the student's overall success in the program.

Students are encouraged and expected to identify a potential major professor or professors in advance of matriculation in the ES program. During the first semester of residence, students should actively discuss research interests and potential projects with their major professor and other ES faculty to ensure that student and professor interests and expectations are aligned. Interdisciplinary projects are highly encouraged, as are research collaborations with faculty or senior scientists both inside and outside UC Merced. As such, Ph.D. students in particular may wish to consider two faculty co-advisors rather than a single advisor.

In Short...

- Each student should discuss research interests and potential projects with ES faculty prior to enrollment and during the first semester of study.
- A major professor (primary advisor) should be determined by the end of the first semester of study, but no later than the end of the second semester.
- The major professor must be ladder-ranked ES faculty.

3.2 Forming your faculty committee

Once the student selects a major professor, the next step is to form a degree committee in consultation with the major professor and other program faculty.

Students and faculty are advised to be aware of potential personal or professional conflicts-of-interest in selecting committee members. For instance, it is best to avoid having spouses on the same committee.

➤ ***For Ph.D. Students***

The role of the degree committee is to:

- Advise on coursework, reading, training, and other activities to guide and prepare the student for his or her dissertation research
- Serve on the qualifying examination committee to assess the student's preparedness for carrying out research
- Supervise the student's dissertation research and advise on professional development

- Review and pass upon the merits of the doctoral dissertation and serve on the final examination committee

Constitution of the Committee

Ph.D. degree committees:

- Consist of a minimum of four members including the major professor
- The majority must be ladder-ranked faculty in ES
- One committee member must be from outside of the ES group. He/she may be a regular or adjunct faculty member from UC Merced, any UC campus, or an individual from outside the University of California who has special expertise and qualifications
- Committee members who are *not* ladder-rank UC faculty (from any campus) must be approved by the Chair and the Graduate Dean. For approval, submit a short c.v. of the proposed outside committee member and a brief justification for including this individual on your committee

➤ *For M.S. Students*

The role of the degree committee is to:

- Advise on coursework, reading, training, and other activities to guide and prepare the student for his or her thesis research
- Supervise the student's thesis research and advise on professional development
- Review and pass upon the merits of the M.S. thesis and serve on the final examination committee

Constitution of the Committee

M.S. degree committees:

- Consist of a minimum of three members including the major professor
- The majority must be ladder-ranked faculty in ES
- A committee member from outside of the ES faculty is *not* required, but can be included. Other committee members may be a regular or adjunct faculty member from UC Merced, any UC campus, or an individual from outside the University of California who has special expertise and qualifications
- Committee members who are *not* ladder-rank UC faculty (from any campus) must be approved by the Chair and the Graduate Dean. For approval, submit a short c.v. of the proposed outside committee member and a brief justification for including this individual on your committee

Once approved, committee members stand and do not need annual re-approval. For either Ph.D. or M.S. students, reconstitution of the committee may be justified by the following circumstances:

- A substantial change in the student's dissertation or thesis topic or may be required by the departure of a committee member from the university
- If a committee member's absence from campus for an extended period of time makes scheduling of examinations unreasonably difficult, the student may request that the committee be reconstituted

When membership changes must be made, the major professor in consultation with the student should recommend a new committee member, giving the reason for the change. *Changes in committee membership after advancement to candidacy must be approved by the Dean of Graduate Studies.*

3.3 Annual Student Evaluations

Students and faculty are required to complete an annual evaluation of student progress in the degree program. Evaluation forms must be completed and submitted to the ES Program Coordinator no later than the last day of spring semester. The annual evaluation becomes part of the student's official record. Before a student advances to candidacy, the annual evaluation should be used to establish the student's committee and to make any changes in committee constitution.

The evaluation form consists of two parts: a self-evaluation completed by the student, and a summary evaluation completed by the major professor in consultation with committee members.

To complete the annual evaluation:

- The student completes the self-evaluation and distributes the completed form together with a *c.v.* to the major professor and all committee members for review.
- **Students are strongly encouraged to meet in person with their major professor and committee members**, either collectively or individually, to discuss research, coursework, examinations, and other activities that contribute to their overall progress towards degree.
- The advisor completes the second part of the form summarizing the student's activities in research, teaching (if applicable) and professional development, incorporating any comments from committee members.
- Student and advisor meet and agree on expectations and timetable for activities to be completed during the next academic year.
- The major professor, all committee members, and the student sign the completed form (electronic signatures acceptable) and submit it to the ES Program Coordinator.

3.4 Graduate Support Staff

Under the auspices of the lead Dean, the School of Engineering (SOE) provides staff support for the ES graduate program. [The graduate program staff](#) in SOE can answer questions and provide guidance on degree program requirements, forms, procedures, and general administration. The SOE graduate staff are also responsible for administering and assisting with student financial support in the form of teaching assistantships (TA), graduate student research (GSR) appointments, and university fellowships.

3.5 University Resources

Campus Life

[Campus Advocacy, Resources and Education \(CARE\)](#)

[Dining Services](#)

[Graduate Student Association \(GSA\)](#)

[Graduate Student Services \(GSS\)](#)

[Office of Campus Climate and Compliance](#)

[Ombuds Services](#)

[Recreation](#)

Academic Services and Support

[Disability Services](#)

[Office of the Registrar](#)

[Office of Research and Economic Development](#)

[Financial Aid](#)

[Graduate Division](#)

[Undocumented Student Services](#)

Health Resources

[Counseling and Psychological Services \(CAPS\)](#)

[Health Services](#)

[Student Health Insurance Plan](#)

International Student Support

[English Language Institute](#)

[International Students and Scholars](#)

Other

[Transportation and Parking Services](#)

Section 4: The Ph.D. Degree Program

The Doctor of Philosophy degree emphasizes original research and generation of new knowledge at its core. The heart of the Ph.D. program is the completion of a piece of original scientific research leading to the preparation and defense of a Ph.D. dissertation. Our program in ES strives to prepare students for a range of career paths in academia, government or industry involving original research and research applications. Students are expected to work both independently and collaboratively in developing and executing their research, which culminates in a written dissertation with chapters that are suitable for publication in peer-reviewed literature.

4.1 Program Learning Outcomes

The overarching goal of the Environmental Systems program is that its graduates be knowledgeable and professionally competent in one or more areas of environmental systems. The following program learning outcomes are being used to attain this goal:

- **Core Knowledge** - Graduates will be knowledgeable, skillful and self-directed in the observation and analysis of environments systems in terms of their capacity to independently identify important research questions, formulate experimental plans, data analysis and formulation of conclusions in the context of a doctoral dissertation.
- **Communication Skills** - Graduates will be conversant in at least two areas of environmental systems, and be adept at oral, written and visual communication of research results to peers and non-technical decision makers
- **Ethics, Community, and Life-long Learning** - Graduates will understand the importance of research and professional ethics, engagement in the needs of their community and life-long learning
- **Career Placement and Advancement** - Graduates will find suitable career placement and achieve advancement in government agencies, non-government organizations, private industry, and/or academic teaching and research institutions

4.2 Residency Requirements

The minimum residency requirement for the Ph.D. degree is **four semesters**. Before advancement to candidacy, Ph.D. students must be registered in regular University courses as a full-time student for at least two semesters. Ordinarily, a graduate student will not receive credit for more than 12 units of graduate courses or more than 16 units of upper division courses in any term.

In Short...

- Students must complete at least 4 semesters of full-time academic residence at UC Merced.
- Students must be registered for 12 units minimum per semester to be considered full-time.

4.3 Coursework Requirements

As there is considerable amount of freedom in the program, Ph.D. students are expected to develop graduate-level competency in both their specific area of research as well as in other areas of Environmental Systems. Students are expected to assume responsibility for designing his/her program in consultation with their major professor and faculty committee. After consultation with faculty, students should submit a program of study with planned coursework to the ES Program Coordinator before registering the first semester in the program. Programs of study must be updated annually as part of the student's spring evaluation until he/she is admitted to candidacy.

Coursework and unit requirements are:

- **ES 200:** Environmental Systems (3 units)*
- **For students *with* an appropriate M.S. degree:** Complete at least 12 units of graded Environmental Systems (ES) courses
- **For students *without* an appropriate M.S. degree:** Complete the coursework requirement for the Environmental Systems M.S. degree (20 graded units; see section 5.3) *plus* a minimum of 12 units of graded Environmental Systems (ES) courses (32 graded units total)
- Enroll in **ES 291:** Environmental Systems Seminar twice for credit (S/U)

**In all graded 200-level courses, students must receive a letter grade of "B" or better in order to receive credit. ES 200 is included in the total units of graded courses.*

Transfer Credit

Ordinarily, all work for the Ph.D. degree is done in residence, but some work taken elsewhere may be credited toward the degree.

The guidelines for transferring credit are:

- Up to 6 units from another institution, or up to ½ of the unit requirement from another UC campus.
- Units of work taken elsewhere than the University of California may not be used to reduce the minimum residency requirement or the minimum requirement in 200-level courses.
- Requests for transfer credit must be made prior to or at the time of advancement to candidacy.
- The major professor makes the request to the Graduate Dean specifying the units and courses involved and provides an official transcript for the course(s).

4.4 Satisfactory Progress

Graduate students **must maintain at least a 3.0 grade-point average** to be considered in good academic standing or to be awarded an academic graduate degree. Please note:

- Only courses in the 100 and 200 series in which the student receives grades of "A", "B", or "S" may be counted in satisfaction of the requirements for advanced degrees.
- A course in which a student receives a "C" or lower cannot be used to satisfy the unit requirement for the degree but will count in determining the grade point average.
- Courses graded "S/U" are not counted in determining grade point averages.

A student whose cumulative graduate grade-point average falls below 3.0, or who is judged not to be making satisfactory progress toward the degree by his or her major professor or degree committee, will be placed on academic probation. The student will then be allowed a maximum of two semesters to make up the deficiencies. Students must make satisfactory progress on their programs of study as determined by their major professor and committee members.

4.5 Advancement to Candidacy

Advancement to candidacy for the Ph.D. degree is a formal step of approval in UC graduate programs that should normally occur before the beginning of the fifth semester (third year) for ES students. It means that the student has completed all of the required and preparatory coursework, scholarly preparation, examination, and research planning needed to carry out research for completion of the dissertation. An important part of this process is the qualifying exam, which should normally be taken before the end of the fourth semester (end of the second year; see below). Once a student has advanced to candidacy, the major professor and degree committee are expected to guide the student in research and the preparation of the written dissertation.

The requirements for Advancement to Candidacy are:

- An approved M.S. degree from another institution or completion of the ES M.S. coursework requirements
- A minimum of two semesters of residency
- Completion of 12 graded ES units (including ES 200) with grade "B" or better
- Passing of the qualifying exam
- Approval of the written research proposal on the dissertation topic

The student must fill out an application for advancement to candidacy and submit it to the Graduate Dean. The application must be signed by the major professor, the faculty committee, and the ES Chair before it can be submitted.

Advancement to candidacy must occur no later than the end of the sixth semester of residence in the ES program.

4.6 The Qualifying Exam

All students in the ES Ph.D. program are required to pass a qualifying examination before advancement to candidacy for the Ph.D. degree. The qualifying exam has a written component and an oral component (described below). The student must pass both components in order to advance to candidacy.

The qualifying examination is normally taken after completion of a majority of formal coursework. It should be taken before the end of the fourth semester in residence (end of the second year, excluding summer semesters), unless the student successfully petitions for a later date.

Purpose of the Qualifying Exam

- To test the student's ability to formulate and defend two short proposals of original research
- To assess the student's basic knowledge and ability to think critically about theoretical and practical aspects of his/her primary field of study and broadly related fields
- To determine the breadth of a student's comprehension of fundamental facts and principles that apply in his/her field of study and related fields
- To assess the student's ability to implement research methods and evaluate outcomes

The student's major advisor and other faculty may assist the student in preparing for the exam through recommended coursework, reading, collection of preliminary data, method development, or other avenues of investigation. Questions during the oral examination should be focused on the student's field of research but may and should venture into other areas of scholarship that underlie or impinge on the dissertation topic.

Expectations for the Written Proposals

The student prepares two short proposals for the qualifying examination (five pages each). Each proposal should present propositions for original research on two substantially different topics and outline a tractable approach for carrying out the research. Proposal topics must be approved well in advance of the exam by the members of the student's degree committee.

For each proposal:

- The student is expected to identify a valid problem of intrinsic value to the scientific community and to develop a research plan to study the problem.
- Proposals may take the form of theoretical developments, computations, field and/or laboratory studies, the exploration of a new technique, or combinations of approaches.
- One proposal may be related to research that the student wishes to pursue for his or her Ph.D. dissertation, but this is not a requirement.
- The student may develop a proposal from work previously performed in a seminar or other coursework.
- The degree committee must approve the two topics in advance of proposal preparation by the student. The degree committee is charged with determining whether the two topics proposed by the student are sufficiently different to assess the student's breath of knowledge.

Timeline for Preparing and Taking the Qualifying Exam

At the start of the second year of residence in the program (third semester), students should work with their major professor and committee members to plan and complete the qualifying exam before the end of their fourth semester.

All members of the degree committee, including the major professor, must be in attendance for the qualifying examination (connection via videoconferencing is acceptable but not encouraged). *An ES ladder-ranked faculty member of the degree committee, who is not the major professor, will chair the examination.* All members of the degree committee, including the major professor, may question the candidate.

Timeline for the Qualifying Exam

- The student proposes a date for the exam and submits draft titles of two proposals to committee members.
- **Not less than six weeks in advance of the oral examination:** The student must meet with his/her degree committee for discussion and approval of the two proposal topics. The student and committee agree on the date of the oral examination and on any modifications to the proposal topics.
- Following the meeting, the student develops a written proposal on each of approved topics (maximum of 5 pages each).
- **At least two weeks before the oral examination date:** The student submits the proposals to committee members.
- The committee conducts the oral examination and determines an outcome. The exam may not be longer than three hours.
- The Chair of the examination immediately submits the results to the Dean of Graduate Studies.

The committee members should include in their evaluation of the examination factors such as: relevant portions of the student's academic record prior to matriculation in the ES program; performance in courses and other activities while in the ES program; quality and originality of the written proposals; and performance on the oral examination questioning. In the end, the outcome of the exam should reflect an overall evaluation of the student's performance and his/her potential for scholarly research and academic success. The committee should strive to reach a unanimous decision and agree on any remedial actions if needed.

Possible outcomes of the exam are:

- 1) Pass: Conditions may not be appended to a pass decision
- 2) Partial pass: Conditions may be applied; acceptable conditions include additional prescribed courses, rewriting proposals or proposal sections, or other remedial actions
- 3) Fail: Only one re-examination is allowed

If a unanimous decision is reached, the committee will inform the student of its decision in one of the forms listed above.

If the decision is "Partial Pass" or "Fail", the chair of the committee must include in a report a specific statement, which may include a minority report, explaining the committee's decision and must inform the student of its decision. In the case of a "Partial Pass", the committee must include in its report a further statement of its terms and inform the student of those terms. In those cases when it is not possible for the members to resolve their differences, 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.

A student who has failed the examination may repeat the qualifying examination after a preparation time of at least three months. The examination must be held by the same committee except that members may be replaced, with the approval of the major professor, 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. **After a second examination, only Pass or Fail is recognized by the Dean of Graduate Studies.**

4.7 Research Proposal

After successful completion of the oral examination, the student will prepare his/her research proposal in consultation with their major professor, and will submit the completed proposal to committee members for review. It is expected that one, or possibly both, of the short proposals prepared for the oral exam will constitute the basis of the research proposal.

The research proposal should

- Describe the research topic, testable hypotheses, proposed methods, and expected outcomes in sufficient detail for the degree committee to evaluate the merit and feasibility of the proposed work
- Summarize relevant published literature and any progress to date by the student
- State the overall importance, relevance, and broader impacts of the proposed study

The research proposal is typically about ten pages in length and should be prepared in the style of a proposal to an external funding agency.

The committee will review this document and determine if the student has outlined a project that is appropriate for a doctoral dissertation. Committee members will respond within two weeks of receiving the research proposal. **If any committee member has serious reservations regarding proposal content**, a meeting of the entire committee with the student will be called to discuss the proposed research. The student is then given a month to rewrite the research proposal. After revisions, the student will submit the final version to committee members for approval. Committee members will indicate their approval of the research proposal by signing the Advancement to Candidacy form.

4.8 Lapse of Candidacy

Candidacy for the Ph.D. will lapse automatically if the student loses graduate standing by academic disqualification or failure to comply with the University policy on continuous registration. A readmitted student who was a candidate for the Ph.D. must again advance to candidacy upon recommendation of the major professor and dissertation committee. The student must enroll as a candidate for at least one

academic semester before the Ph.D. will be conferred.

4.9 Dissertation and Defense

The dissertation and defense are the culminating projects of the Ph.D. degree. The student is encouraged to discuss with members of the degree committee both the substance and the preparation of the dissertation well in advance of the planned date of dissertation defense and final examination.

Expectations of the Dissertation

- The Ph.D. dissertation must be creative and independent work that can stand the test of peer review.
- The material should serve as the basis for publication(s) in a peer-reviewed journal.
- The work must be the student's, and it must be original and defensible.

Guidelines for Submitting the Dissertation and Scheduling the Defense

All members of the degree committee must be in attendance for the entire defense, both public and closed sessions (connection via videoconferencing is acceptable but not encouraged). *An ES ladder-ranked faculty member of the degree committee, who is not the major professor, will chair the defense.*

Process and Timeline for the Final Defense

- **Before scheduling the defense date:** The student must provide a copy of the dissertation to each member of the degree committee and allow **three weeks** for reading and commenting.
- 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 the defense.
- Once the committee members agree that the dissertation is ready to be defended (although minor errors or matters of controversy may still exist), the final defense date may be scheduled by the student in consultation with the committee.
- **At least three weeks before the defense date:** The student submits a copy of the dissertation to committee members and to the ES Program Coordinator. The public seminar for the defense should be advertised widely to the ES community prior to the defense date.
- The defense consists of an open seminar by the candidate followed by questions from the audience (approximately 1 hour).
- The open session is followed by a closed session of the candidate and degree committee members (examination portion). The entire defense and exam may not be longer than three hours.
- At the conclusion of the exam, the committee shall vote on whether both the written dissertation and the student's performance are satisfactory to earn a Ph.D. degree from the University of California. A simple majority is required for a pass.

Expectations for the Defense

The Ph.D. final defense and examination consists of an open seminar on the dissertation work followed by a closed examination by the degree 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.**

Members of the committee may vote to make conferral of the degree contingent on corrections and/or revisions to the dissertation. In this case, the committee will select one member, normally the major professor, who will be responsible for approving the final version of the dissertation that is submitted to the Division of Graduate Studies. All members of the degree committee must sign the final dissertation.

After the Defense

Upon completion of the final examination and approval of the dissertation, the Doctoral Committee recommends, by submission of the Ph.D. Exam 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.

The submission of the dissertation is the last step in the program leading to the award of the Ph.D. degree. Once the committee has signed the final thesis, please follow the steps in the [Checklist for the Completion of Doctoral Degree](#) (available on the Graduate Division website) for further instructions on submitting and publishing the thesis. All dissertations submitted in fulfillment of requirements for advanced degrees must conform to University regulations and specifications with regard to format and method of preparation. [The UCM Thesis and Dissertation Manual](#) for writing and submitting theses/dissertations is available at the Graduate Division.

The final, signed version of the dissertation must be submitted by the deadline in the semester in which the degree is to be conferred (check with the Graduate Division for dates). Those students who complete requirements but submit dissertations after the end of the semester will earn a degree for the following semester. To avoid payment of fees, the dissertation and all forms must be submitted prior to the first day of the semester in which the degree is to be earned.

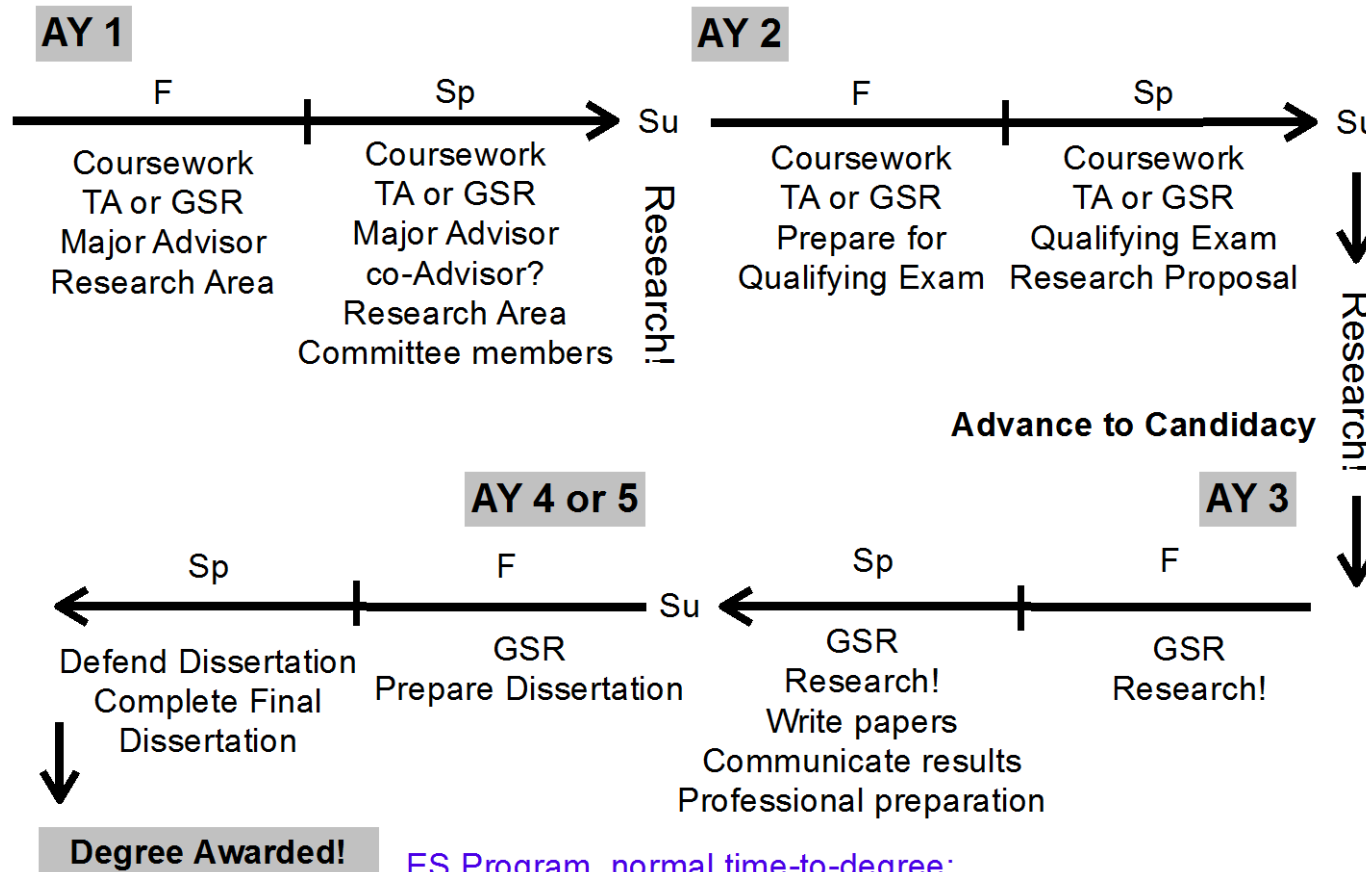
4.10 Expected Time to Degree

The expected time for completing the Ph.D. degree:

- **For a student entering the program *with* an M.S. degree** in a relevant field is **4 years**.
- **Students entering the program *without* an M.S. degree** typically will require an additional year or more of study to prepare for their doctoral research.

A timeline on completing the Ph.D. program in the expected timeframe can be found on the following page.

Roadmap to Success: A timeline for a Ph.D. Degree



ES Program, normal time-to-degree:

Ph.D. = 4 Years w/ prior M.S. degree; 5 Years w/o M.S. degree

Section 5: The M.S. Degree Program

The Master's of Science (M.S.) degree in Environmental Systems is designed to educate students for careers across a broad range of environmental fields, both by coursework preparation and completion of an independent research project that constitutes the M.S. thesis. Students are expected to work independently and collaboratively under faculty supervision in determining their coursework and plan of study, and in developing and executing their research, which culminates in a written thesis.

5.1 Program Learning Outcomes

The overarching goal of the Environmental Systems program is that its graduates be knowledgeable and professionally competent in one or more areas of environmental systems. The following program learning outcomes are being used to attain this goal:

- **Core Knowledge** - Graduates will be knowledgeable, skillful and self-directed in the observation and analysis of environments systems in terms of their capacity to design experiments with appropriate controls and conduct original research, with an appropriate level of supervision, in the context of a master's of science thesis
- **Communication Skills** - Graduates will be conversant in at least two areas of environmental systems, and be adept at oral, written and visual communication of research results to peers and non-technical decision makers
- **Ethics, Community, and Life-long Learning** - Graduates will understand the importance of research and professional ethics, engagement in the needs of their community and life-long learning
- **Career Placement and Advancement** - Graduates will find suitable career placement and achieve advancement in government agencies, non-government organizations, private industry, and/or academic teaching and research institutions

5.2 Residency Requirements

The minimum residency requirement for any advanced degree is **two semesters**. M.S. students must be registered as a full-time student for at least one semester before advancement to candidacy, and for at least one semester after advancement to candidacy and before conferral of the degree. Ordinarily, a graduate student will not receive credit for more than 12 units of graduate courses or more than 16 units of upper division courses in any term.

In Short...

- Students must complete at least 2 semesters of full-time academic residence at UC Merced.
- Students must be registered for 12 units minimum per semester to be considered full-time.

5.3 Coursework Requirements

As there is considerable amount of freedom in the program, M.S. students are expected to assume responsibility for designing his/her program in consultation with their major professor and faculty

committee to support thesis research. After consultation with faculty, students should submit a program of study with planned coursework to the ES Program Coordinator before registering the first semester in the program. Programs of study must be updated annually as part of the student's spring evaluation until he/she is admitted to candidacy.

Coursework and unit requirements are:

- **ES 200:** Environmental Systems (3 units)*
- A minimum of 24 units of graduate and upper-division courses (graded and S/U)
- Of the 24 units, at least 20 units must be graded graduate (200-level) courses in the major subject (normally ES courses but other 200-level courses can be taken with approval by the major professor)
- Enroll in **ES 291:** Environmental Systems Seminar twice for credit (S/U)

**In all graded 200-level courses, students must receive a letter grade of "B" or better in order to receive credit. ES 200 is included in the total units of graded courses.*

Transfer Credit

Though ordinarily all work for the M.S. degree is done in residence, some work taken elsewhere may be credited toward the degree.

The guidelines for transferring credit are:

- Up to 6 units from another institution, or up to ½ of the unit requirement from another UC campus.
- Units of work taken elsewhere than the University of California may not be used to reduce the minimum residency requirement or the minimum requirement in 200-level courses.
- Requests for transfer credit must be made prior to or at the time of advancement to candidacy.
- The major professor makes the request to the Graduate Dean specifying the units and courses involved and provides an official transcript for the course(s).

5.4 Satisfactory Progress

Graduate students **must maintain at least a 3.0 grade-point average** to be considered in good academic standing or to be awarded an academic graduate degree. Please note:

- Only courses in the 100 and 200 series in which the student receives grades of "A", "B", or "S" may be counted in satisfaction of the requirements for advanced degrees.
- A course in which a student receives a "C" or lower cannot be used to satisfy the unit requirement for the degree but will count in determining the grade point average.
- Courses graded "S/U" are not counted in determining grade point averages.

A student whose cumulative graduate grade-point average falls below 3.0, or who is judged not to be making satisfactory progress toward the degree by his or her major professor or degree committee, will be placed on academic probation. The student will then be allowed a maximum of two semesters to make up the deficiencies. Students must make satisfactory progress on their programs of study as determined by their major professor and committee members.

5.5 Advancement to Candidacy

Advancement to candidacy for the M.S. degree is a formal step of approval in UC graduate programs that signifies that the student has completed all of the required and preparatory coursework and is nearing completion of research for the thesis. **Advancement to candidacy must be filed at least one semester before completion of all degree requirements and degree conferral.**

The requirements for Advancement to Candidacy are:

- A minimum of one semester of full-time residence (a total of 12 units)
- Completion of at least 12 units of graded graduate (200-level courses)
- Sufficient research progress as judged by the major professor and degree committee

The student must fill out an application for advancement to candidacy and submit it to the Graduate Dean. The application must be signed by the major professor, the faculty committee, and the ES Chair before it can be submitted.

5.6 Thesis and Defense

The culmination of the M.S. program is the completion of a piece of original scientific research leading to the preparation and defense of a M.S. thesis. The expectation is that the material will serve as the basis for publication(s) in peer-reviewed literature. The student is encouraged to discuss with members of the degree committee both the substance and the preparation of the thesis well in advance of the planned defense and examination date.

Expectations of the Thesis

- The M.S. thesis must be the student's independent and creative work that can stand the test of peer review.
- The thesis topic should be acceptable to all members of the degree committee and must be approved by the degree committee.
- A joint meeting of the committee members and the student should be held when committee members agree to serve and before preparation of the thesis.

Guidelines for Submitting the Thesis and Scheduling the Defense

All members of the degree committee must be in attendance for the entire defense, both public and closed sessions (connection via videoconferencing is acceptable but not encouraged). *An ES ladder-ranked faculty member of the degree committee, who is not the major professor, will chair the defense.*

Process and Timeline for the Final Defense

- **Before scheduling the defense date:** The student must provide a copy of the thesis to each member of the degree committee and allow **at least two weeks** for reading and commenting.
- If one or more committee members believe that there are significant errors or shortcomings in the thesis or that the scope or nature of the work is not adequate, the student must address these shortcomings before scheduling the defense.
- Once the committee members agree that the thesis is ready to be defended (although minor errors or matters of controversy may still exist), the final defense date may be scheduled by the student in consultation with the committee.
- **At least two weeks before the defense date:** The student submits a copy of the thesis to committee members and to the ES Program Coordinator. The public seminar for the defense should be advertised widely to the ES community prior to the defense date.
- The defense consists of an open seminar by the candidate followed by questions from the audience (approximately 1 hour).
- The open session is followed by a closed session of the candidate and degree committee members (examination portion). The entire defense and exam may not be longer than three hours.
- At the conclusion of the exam, the committee shall vote on whether both the written thesis and the student's performance are satisfactory to earn a M.S. degree from the University of California. A simple majority is required for a pass.

Expectations for the Defense

The M.S. final defense and examination consists of an open seminar on the thesis work followed by a closed examination by the degree committee. **During the examination, the student is expected to explain the significance of the thesis research, justify the methods employed, and defend the conclusions reached.**

Members of the committee may vote to make conferral of the degree contingent on corrections and/or revisions to the thesis. In this case, the committee will select one member, normally the major professor, who will be responsible for approving the final version of the thesis that is submitted to the Division of Graduate Studies. All members of the degree committee must sign the final thesis.

If the thesis is regarded as of less than acceptable quality, the student should be given an appropriate period of time, clearly specified by the committee, in which to improve her/his work. If, after that period of time (usually a semester), the thesis is still unacceptable to a majority of the committee, the majority may recommend to the Dean of Graduate Studies that the student be disqualified from further graduate study.

After the Defense

Once the committee has signed the final thesis, please follow the steps in the [Checklist for the Completion of Master's Degree](#) (available on the Graduate Division website) for further instructions on

submitting and publishing the thesis. The [UCM Thesis and Dissertation Manual](#) for writing and submitting theses/dissertations is available at the Graduate Division.

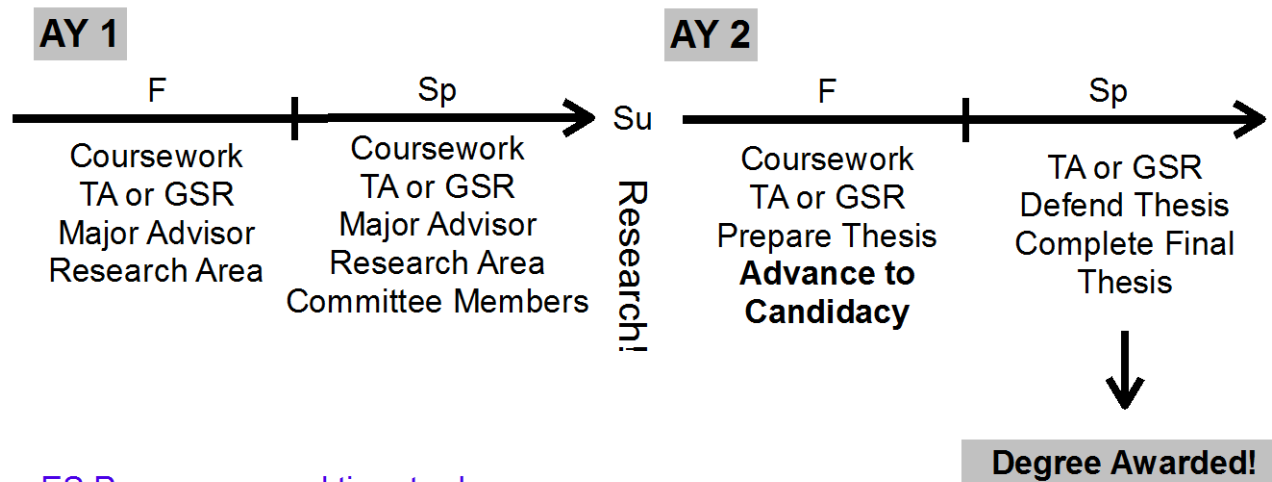
All requirements for the M.S. degree must be submitted by the deadline in the semester in which the degree is to be conferred (check with the Graduate Division for dates). Those students who complete their final defense but submit the final thesis after the end of the semester will earn a degree for the following semester. To avoid payment of fees, the thesis and all forms must be submitted prior to the first day of the semester in which the degree is to be earned.

5.7 Expected Time to Degree

The expected time for completing the M.S. program, including the thesis, is two years (4 academic-year semesters). Completion of research towards the thesis often requires that the student work on his or her research project over the summer.

A timeline on completing the M.S. program in the expected timeframe can be found on the following page.

Roadmap to Success: A timeline for a M.S. Degree



ES Program normal time-to-degree:
M.S. = 2 Years

Section 6: Tips and Resources for Success

- [Tools for Success in Graduate School and Beyond](#) (University of Texas at Austin)
- [Some Modest Advice for Graduate Students](#) (Dr. Stephen C. Stearns, Yale University)
- [Seven Steps to Success in Graduate School \(and Beyond\)](#) (Rice University)
- [There's No Crying in Graduate School](#) (Rachel Verona Cote, via Vitae)

6.1 Professional Development

The Graduate Division offers a variety of workshops and other resources for professional development, including:

- [Graduate Enrichment & Advancement & Research Services program](#)
- [Conferences and travel funding awards](#)
- How to create an effective poster presentation from former UC Merced Grad student Justin Matthews: <http://justinlmatthews.com/posterhelp/posterguide/>
- [Center for Career & Professional Advancement](#)

6.2 Resources for Teaching

- [UC Merced Center for Engaged Teaching and Learning \(CETL\)](#)
- [Graduate Division Teaching Resources](#)

6.3 Writing Resources

- [Dissertation Bootcamp](#)
- [Graduate Writing & Data Management](#)
- [Merritt Writing Program](#)
- [Grant Writing Resources](#)

6.4 Mentorship Resources

UC Merced's Graduate Council has provided guidelines on establishing and maintaining a positive student/advisor relationship. Students and faculty are encouraged to visit these guidelines, found on Graduate Council's resources page under: [Mentoring Guidelines](#).