STANFORD UNIVERSITY
EMMETT INTERDISCIPLINARY PROGRAM IN
ENVIRONMENT and RESOURCES

PROGRAM REQUIREMENTS FOR THE E-IPER PHD
ACADEMIC YEAR 2011-2012
(effective date September 1, 2011)

VISION
The Emmett Interdisciplinary Program in Environment and Resources (E-IPER) is designed to create leaders in research and problem solving on the environment and sustainability. E-IPER spans a broad interface between natural and human systems, crossing Stanford's school and department boundaries to offer a unique graduate school experience. E-IPER students acquire an integrated understanding of environmental processes and problems and gain the tools required to address these complex issues in the real world. Their work is fueled by a powerful combination of idealism and determination to advance knowledge and improve the world.

E-IPER STUDENT RESPONSIBILITY
Students are E-IPER's greatest source of strength, bringing extraordinarily diverse academic backgrounds and life experiences from around the world. E-IPER can be more challenging than traditional, disciplinary graduate programs: it offers tremendous scope and flexibility, and at the same time demands focus and leadership on the part of students.

With support from E-IPER faculty and staff, each student manages his or her own academic experience and career. Students often work in domains beyond the expertise of their advisors and therefore must take the lead in finding the appropriate methods, collaborators, and other resources for their research. E-IPER students encounter a wide array of scholars with distinct ways of doing research, and must assess which mix of advisors and approaches best serves their goals. Each student is encouraged to cultivate a relationship with two lead faculty advisors, starting during the first two years as research projects are formulated. Lead Advisors serve as champions, critics, and sources of financial and other professional support.

REQUIREMENTS FOR THE PHD IN ENVIRONMENT AND RESOURCES
The minimum requirements for the PhD in Environment and Resources outlined here represent fundamental steps in developing first-rate research and in acquiring skills key to success in both academic and non-academic careers. E-IPER core courses provide exposure to current environmental problems, familiarity with research design and qualitative and quantitative methods, and an opportunity to get to know diverse faculty. Beyond the core courses, the program is structured to be rigorous yet flexible, accommodating the needs of a tremendous range of individual problem-solving approaches while serving the principal goal of providing training in advanced interdisciplinary problem-solving.

I. COURSEWORK
As interdisciplinary researchers, E-IPER students should demonstrate an understanding of several intellectual Fields of Inquiry, with facility in using their language and methods, and a general appreciation of what constitutes knowledge in these fields. Specifically, E-IPER students work with their faculty advisors in designing a course of study that must achieve three goals:

(A) become familiar with a wide variety of ***analytical tools and research approaches*** for interdisciplinary problem-solving and mastery of those tools and approaches central to the student's thesis work, acquired through the E-IPER core courses;

(B) achieve breadth of knowledge in each of four ***Focal Areas***, defined below; and

(C) develop mastery in two ***distinct Fields of Inquiry***, defined by the student and his/her Lead Advisors.

In pursuit of these goals, each student will take a combination of E-IPER core courses and additional course work and independent study, as determined in consultation with his or her advising team. Students should develop deep knowledge and understanding in areas of their particular research interests, with the aim of conducting innovative, first-rate research. Students can demonstrate that they have attained the necessary skills in the Breadth Areas and their selected Fields of Inquiry through a combination of coursework, experience, and research, to be assessed and approved by each student's qualifying committee. Students should work closely with their Lead Advisors and committee in developing a course of study tailored to the student's background and desired future work.

A. CORE PHD COURSES: INTRODUCTION TO ANALYTICAL TOOLS AND APPROACHES FOR INTERDISCIPLINARY RESEARCH

The following four core courses, designed to introduce students to research methods and techniques, must be taken by all E-IPER PhD students for a letter grade. A grade of B or higher must be earned. Following these introductory courses, students will develop in-depth expertise in the research methods and techniques necessary to advance their particular research interests.

1) ENVRES 310, Environmental Forum Seminar (AUT, 1-2 units). Conceptual frameworks, analytical approaches, and validity of conclusions from an interdisciplinary research perspective. Participants attend various environmentally-focused seminars on campus selected by faculty and students, followed by student-facilitated discussions.

2) ENVRES 315, Environmental Research Design Seminar (WTR, 1-2 units). Series of faculty presentations and student-led discussions on interdisciplinary research design, as exemplars of the research design theories being discussed in ENVRES 320. Designing Environmental Research, which is a corequisite. Topics parallel the ENVRES 320 syllabus.

3) ENVRES 320, Designing Environmental Research (WTR, 4 units). Research design options for causal inference in environmentally related research. Major philosophies of knowledge and how they relate to research objectives and design choices. Identification of critical elements within a broad range of research designs. Evaluation of the types of research questions for which different designs are suited, emphasizing fit between objectives, design, methods, and argument. Development of individual research design proposals, including description and justification understandable to a non-specialist.

4) ENVRES 330, Research Approaches for Environmental Problem Solving (SPR, 3 units). How to develop and implement interdisciplinary research in environment and resources. Assignments include development of research questions, a preliminary literature review, and a summer funding proposal. Course is structured on peer critique and student presentations of work in progress. Taken concurrently with ENVRES 398. Directed Individual Study in Environment and Resources under the faculty member chosen to explore a possible dissertation topic.

B. BREADTH OF KNOWLEDGE IN FOUR FOCAL AREAS

Students are expected to establish breadth of understanding in each of four areas, defined as:

(1) Culture and Institutions

(2) Economics and Policy Analysis
(3) Engineering and Technology
(4) Natural Sciences

These **minimum** breadth requirements vary by area and are normally satisfied through a sequence of courses (see Appendix I), independent study, and/or demonstration of proficiency through prior course work and/or experience. A Master's degree automatically satisfies breadth in the area in which the degree was conferred, and a Bachelor's degree does in most circumstances.

Students and advisors should discuss a strategy for fulfillment of breadth requirements during their first year advising sessions (Autumn & Winter Quarters) and the First Year Big Picture advising meeting (Spring Quarter). For some students, following a prescribed course sequence may be the preferred way to attain breadth, while others may elect to undertake a more individualized combination of classes, research, and other experiences.

The requirements outlined below constitute the minimum means by which one can attain operational literacy in each focal area; most students will exceed the minimum requirements outlined here in several focal areas. The courses listed in Appendix I are not exclusive and students may use the Breadth Certification form to suggest alternative pathways to fulfill the breadth requirement.

(1) Culture and Institutions

This focal area encompasses the social sciences and humanities, including anthropology, communication, decision sciences, history, law, political science, psychology, and sociology. Breadth in Culture and Institutions might involve understanding the central logic and research approaches for investigating dynamic human systems at varying scales from the individual to global society. Breadth in this area may be achieved by taking at least two of any of a diversity of courses, with suggestions given in the Culture and Institutions section of Appendix I.

(2) Economics and Policy Analysis

This focal area exposes students to the skills and concepts, listed below, which are essential to understanding the applied professional literature in environmental economics and policy analysis; diagnosing economic sources of environmental problems; and designing and evaluating alternative policy remedies:

- How markets function
- Sources of market failures
- Welfare analysis
- Valuation
- Discounting
- Criteria for policy evaluation
- Policy tools and instruments

These minimal skills and concepts can be gained by completing one of the course sequences outlined in the Economics and Policy Analysis section of Appendix I.

(3) Engineering and Technology

This focal area exposes students to quantitative engineering approaches to solving environmental and natural resource problems and provides students with the minimum quantitative skills to be able to understand the literature. Students are free to explore a wide range of engineering solutions to

environmental issues, from technological innovation to institutional changes, and should understand the role and limitations of technology in causing and solving environmental problems. Students are required to take at least one course in this breadth area; examples of appropriate courses are listed in the Engineering and Technology section of Appendix I. A student and his/her advisors may select any course deemed relevant to the student's particular interests provided it exposes the student to quantitative engineering approaches to solving environmental and natural resource problems.

(4) Natural Sciences

This focal area familiarizes students with the natural science underpinnings of environment and resource issues. As environmental problem-solvers, students are expected to have an understanding of the history and current dynamics of natural systems, and of human dependence and impacts on them. Students are required to take at least two courses in this breadth area; examples of appropriate courses are listed in the Natural Sciences section of Appendix I.

The **Breadth Certification Form** certifies that students have achieved this goal, and must be signed by the student's Lead Advisors and the E-IPER Faculty Director. Students are strongly encouraged to take upper-level, advanced courses that support their intended research focus. To fulfill the breadth requirement, courses must be at a 100-level (with the exception of specific pre-requisites) or above, rated at three units or more, and taken for a letter grade. Approved courses are given in Appendix I, which will be updated annually. Students may also use the Breadth Certification Form to propose satisfying a breadth or partial breadth requirement through a course or courses not currently listed or taken elsewhere, either during a previous degree or concurrently with the E-IPER degree, provided the proposed course(s) exposes the student to concepts and approaches to environmental and natural resource problem solving within the specified breadth area. The signatures of Advisors and Directors serve as approval. Although some courses could conceivably satisfy more than one breadth area, "double-counting" is not permitted. Students can choose, with their Lead Advisors, which single breadth area they would like to satisfy (or partially satisfy) with a given course or prior degree.

C. MASTERY IN TWO DISTINCT FIELDS OF INQUIRY

Students will take additional coursework to learn appropriate research methods and to acquire deeper knowledge in their chosen Fields of Inquiry. Fields of Inquiry are the central focus of dissertation research and are defined as areas of scholarship and/or expertise, and are not restricted to particular disciplines, departments, or the breadth areas defined above. Students have the freedom to define and choose the two Fields of Inquiry in which they would like to develop depth of understanding and which are distinct enough to ensure the student's research is interdisciplinary.

Students must formally identify their two Fields of Inquiry – and corresponding Lead Advisors who have expertise in these defined Fields of Inquiry – within the first two weeks of Spring Quarter of their second year, using the **Lead Advisors and Fields of Inquiry Identification Form**. This form must be signed by the student's two Lead Advisors, who should have expertise in the two depth areas (as described below, in Section II). Certification of the coursework taken to demonstrate mastery of these two distinct Fields of Inquiry is done via the **Fields of Inquiry Certification Form**, typically around the time of a student's Qualifying Exam in the third year, and must be before the student is admitted to TGR status. These processes are described in more detail in Section II: Year-by-Year Advising and Milestones.

D. POLICY ON GRADES

E-IPER PhD students are expected to take the following courses for a letter grade: all core courses; all courses to satisfy breadth, apart from undergraduate prerequisites; and the majority of courses in the two Fields of Inquiry. Students must maintain a GPA of at least 3.0 and must earn at least a "B" grade in all

core courses. Unusual circumstances may be approved using the **E-IPER Exceptions Form**, to be signed by the two Lead Advisors and the Faculty Director of E-IPER.

E. EXCEPTIONS

Students may petition to satisfy certain academic goals or seek exception to select program policies through alternative routes using the **E-IPER Exceptions Form,** to be signed by the student's two Lead Advisors and the E-IPER Faculty Director. Because exceptions are expected to be granted only rarely, a student must show good cause in seeking one.

II. YEAR-BY-YEAR ADVISING AND MILESTONES

Seeking out faculty who can inspire and guide their research is arguably the most challenging and rewarding aspect of being an E-IPER student. In addition to meeting formally with their First Year Advisors and other faculty, students should start meeting informally with faculty and one or more research groups, comprising other graduate students and postdoctoral scholars, as soon as they arrive. Recruiting an engaged faculty team who may ultimately comprise his or her qualifying and thesis committees should be a high priority during the student's first two years in E-IPER.

A. FIRST YEAR

1) FIRST YEAR ADVISING MEETINGS *(Aut, Wtr, 1st year)*

All first year students participate in a program-organized advising session at the beginning of autumn and winter quarters. Attendees are generally two First Year Advisors, identified from suggestions the student makes before arriving at Stanford, the Associate Director, and one or two current students. These meetings are scheduled by the Student Services Manager and focus primarily on discussing courses and preliminary research ideas. Students prepare and distribute beforehand an informal summary of their prior experience, perceived strengths and weaknesses, and preliminary research ideas (there is no template for this document). Students are encouraged to contact one or both of their First Year Advisors at other times throughout the year as well as to seek advice from additional faculty and students.

2) FIRST YEAR BIG PICTURE ADVISING MEETING *(Spr, 1st yr)*

First year advising culminates with the student-organized First Year Big Picture Advising Meeting, which takes place during Spring Quarter or, in very exceptional cases, during Summer Quarter. This First Year Big Picture Meeting is a special opportunity intended to give students a chance to think broadly about their time in E-IPER while outlining their research, professional development, coursework, teaching, and service goals, and to get feedback on these from a team of faculty. This is a chance to explore ideas and strategize next research steps on the way to developing an interdisciplinary dissertation proposal; to determine what additional courses should be taken to satisfy breadth requirements; to begin to define the student's two Fields of Inquiry; and to get early "buy-in" from faculty who may potentially serve as Lead Advisors or committee members, making the process of recruiting faculty easier down the line.

In addition to the Associate Director, the student typically invites four or more faculty members from different disciplines, most likely including the two First Year Advisors and others who might serve as the student's Lead Advisors or potential committee members. It is recommended that a detailed meeting agenda is distributed to the Big Picture advising team a week in advance of the meeting so everyone arrives understanding the goals and context of the meeting. A copy should also be sent to the Student Services Manager to certify the Big Picture Session has occurred. A sample agenda can be accessed on E-IPER's Requirements and Forms webpage, and current students have posted their agendas on the student Wiki.

3) ANNUAL REVIEW

The First Year Big Picture Meeting is a component of the Annual Review process (see Section VI.

Student Annual Review). Students should bring their completed First Year Annual Review form, which seeks information not captured in the Big Picture document, to the meeting and allow time on the meeting's agenda for discussion. First Year students who do not submit an E-IPER or SES Summer Grant proposal will be required to include a more detailed written description of their summer plans on their Annual Review Form. Students submitting one of these grant proposals can summarize their plans on the Annual Review form in just a few sentences. In exceptional cases in which a student's interests have definitively moved away from one of the two First Year Advisors, the student should ask another faculty member to participate in the Annual Review and serve as a short-term second advisor until the student selects his or her two Lead Advisors in the second year.

B. SECOND YEAR

1) CHOOSING LEAD ADVISORS AND FIELDS OF INQUIRY *(Wtr-Spr, 2nd yr)*

Within the first two weeks of Spring Quarter in their second year, at the latest, students must formally designate their two Fields of Inquiry and identify two corresponding faculty Lead Advisors, using the **Lead Advisors and Fields of Inquiry Identification Form,** as mentioned in Section I. Coursework. Students who organize their Second Year Meeting of the Minds (described below) before Spring Quarter should submit this form at least two weeks ahead of their scheduled meeting. The primary Lead Advisor must be a member of Stanford's Academic Council; the second Lead Advisor will also normally be a member of the Academic Council. In exceptional cases, the second Lead Advisor may be someone who is not on the Academic Council or who is outside Stanford but who is intellectually well-aligned with the student's Field of Inquiry. Such cases should be discussed with the Associate Director in advance of the **Lead Advisors and Fields of Inquiry Identification Form** being submitted and a brief explanation amended to the form.

The two Lead Advisors will have joint responsibility for ensuring the professional development of the student. Students should maintain close contact with both Lead Advisors and with other potential advisors as well, with the intent of creating and sustaining an engaged and interdisciplinary Qualifying Exam Committee in their third year.

Any changes in a Lead Advisor should occur before the **Qualifying Exam Eligibility Approval and Committee Designation Form** is submitted early in the Winter Quarter of the student's third year. In the case of a Lead Advisor change, the student will submit an amended **Lead Advisors and Fields of Inquiry Identification Form.**

2) SECOND YEAR MEETING OF THE MINDS *(Spr, 2nd yr)*

It is crucial for students to engage in and facilitate communication among prospective Qualifying Exam Committee members. At the end of the second year, students organize a Second Year Meeting of the Minds with prospective qualifying committee members. This is an opportunity to discuss and present their Candidacy Plan (described below) so expectations about preparing for the Qualifying Exam are uniformly understood by the student and faculty. The Second Year Meeting of the Minds provides an opportunity for faculty to get to know the student and one another better, and can help elucidate important ideas as well as hurdles prior to the Oral Qualifying Exam. Additional courses or training opportunities the student may need to complete his/her dissertation research can also be identified. In addition to the Associate Director, the student typically invites 4-5 faculty, his/her Lead Advisors and other prospective Qualifying Exam Committee members.

For the Second Year Meeting of the Minds, the student should prepare a 10-15 minute oral presentation of his/her Candidacy Plan (see Section 3. Candidacy Plan, below), with a focus on research ideas and objectives. The Candidacy Plan, which may be in draft form at the meeting, serves as the meeting's advising document and should be circulated to attendees a week in advance. The final version, incorporating input from the Second Year Meeting of the Minds, must be submitted to the Associate

Director, Student Services Manager, and the Lead Advisors by the last day of Spring Quarter, which certifies that the Meeting of the Minds occurred.

3) CANDIDACY PLAN *(Spr, 2nd yr)*
The Candidacy Plan is discussed with faculty in the Second Year Meeting of the Minds (revisions may be added after the meeting) and the final version must be submitted to the Associate Director, Student Services Manager, and the Lead Advisors by the last day of Spring Quarter. The Candidacy Plan should include the following items: (a) a list of courses or experiences used or expected to fulfill the E-IPER Breadth and Fields of Inquiry requirements; (b) the course(s) TA'd or intended to be TA'd to fulfill the teaching requirement; (c) a paragraph summarizing the student's research ideas; (d) a list of faculty who could guide those ideas, thus potentially becoming Qualifying Exam Committee members; (e) the scheduled date of the Second Year Meeting of the Minds (see above), including a list of attendees. The plan will be reviewed and is subject to approval by the Faculty Director of E-IPER. An example Candidacy Plan can be accessed on E-IPER's Requirements and Forms webpage.

4) ANNUAL REVIEW
The Second Year Meeting of the Minds and the approved Candidacy Plan are components of the Annual Review (see Section VI. Student Annual Review). Students should bring their completed Second Year Annual Review form, which seeks information not captured in the Candidacy Plan, to the meeting and allow time on the Second Year Meeting of the Minds' agenda for discussion. Second Year students who do not submit an E-IPER or SES Summer Grant proposal will be required to include a more detailed written description of their summer plans on their Annual Review Form. Students submitting one of these grant proposals can summarize their plans on the Annual Review form in just a few sentences.

Note: while Lead Advisor selection, the Second Year Meeting of the Minds and the Candidacy Plan are all to be completed in Spring Quarter, it is expected and recommended that "groundwork" and preparations for these milestones take place throughout the second year and that the accompanying documents simply confirm and finalize these required steps.

C. THIRD YEAR
1) QUALIFYING PROCESS AND ADMITTANCE TO CANDIDACY
E-IPER students are expected to qualify for the doctoral degree *by the end of Winter Quarter of their third year*. To be admitted to candidacy for the Ph.D. degree, a student must have successfully completed at least 25 graded units (not including research credits) of graduate courses (200 level and above), maintaining at least a 'B' average, and have passed the Oral Qualifying Examination. The student may not have any incompletes on his/her transcript. The Qualifying Process, including quarter by which each milestone must be completed, is outlined in detail below.

The purpose of the Oral Qualifying Examination is to assist students in the transition from coursework and skill development to the design and implementation of original research. The process provides an opportunity for students and the faculty engaged in their research to account for student progress and to focus collectively on the creation and execution of a research plan. The process is designed to assist students in their career development, and certify that those who pass are prepared to proceed with the completion of their research and degree.

Academic disciplines have distinct cultures and traditions that strongly shape the nature of dissertation proposals and qualifying procedures. Because E-IPER students are working across these distinct cultures, every E-IPER proposal will likely be "outside the norm" of what is currently expected within each contributing discipline. Given this, E-IPER is flexible in the details of the Oral Qualifying Exam procedure, though the emphasis is expected to be on discussion of the student's proposed research rather than examination of a student's knowledge of a specific discipline. These general guidelines set a common standard, ensure equity, and inform students, advisors and the broader E-IPER community of

our expectations.

a) ORAL QUALIFYING EXAM COMMITTEE AND ELIGIBILITY FORM *(Aut-Wtr, 3rd yr)*
During Autumn Quarter of their third year, students should actively engage faculty who might serve on their Oral Qualifying Exam Committee. The Oral Qualifying Exam Committee should include the student's two Lead Advisors and 2-3 other faculty with expertise in the student's Fields of Inquiry and/or research methods. The majority of the Oral Qualifying Exam Committee should be members of the Academic Council; the Chair must be a member of the Academic Council and may not be one of the student's Lead Advisors. The role of the Chair is to facilitate the meeting, especially the discussion following the student's presentation; students may opt to inform their Chair ahead of time about their preferred format and structure. In exceptional cases, the Oral Qualifying Exam Committee may include a "member-at-large" who is not a Stanford faculty member as a fourth or fifth member. (Note that the Oral Qualifying Exam Committee is distinct from the University Oral Exam Committee (dissertation defense) which is discussed is Section D. Fourth Year and Beyond.)

In preparation for their exam, students submit to the Associate Director or Student Services Manager the signed **Qualifying Exam Eligibility Approval and Committee Designation Form** within the first two weeks of the quarter during which the Qualifying Exam will be taken. On this form, the student formally designates his/her Committee and all members are expected to sign, acknowledging their role and accepting their responsibilities in serving as a Qualifying Exam Committee member. The Lead Advisors sign to certify that the student has made sufficient progress in coursework and proposal development so that s/he is eligible to qualify by the end of that quarter. In addition, the Student Services Manager signs to certify that the student has: a) completed the E-IPER requirements for Candidacy (other than the Oral Qualifying Exam); b) maintained a GPA of at least 3.0; and c) cleared all incompletes appearing on his/her transcript.

Normally, membership of the Oral Qualifying Exam Committee should not change after submission of the **Qualifying Exam Eligibility Approval and Committee Designation Form**. Any proposed changes to this process need to be approved by the E-IPER Executive Committee, using the **E-IPER Exceptions Form.**

b) DISSERTATION PROPOSAL *(Wtr, 3rd yr)*
A written dissertation proposal should be distributed to a student's Oral Qualifying Exam Committee, with a copy to the Associate Director and Student Services Manager, at least ten days before the actual examination. This proposal should be 15 to 30 pages in length, double-spaced, excluding appendices and references. It should include a title page, an abstract, an introduction outlining and motivating the research questions, a background literature review establishing the intellectual context of the proposed work, a description of the methodology and approaches to be taken in the work, a discussion of results and other progress made to date, a time line for future research, and a reference section. The proposal should discuss explicitly the interdisciplinary nature of the research and why it is appropriate for a degree in Environment and Resources. The proposal should form the basis of the discussion at the Oral Qualifying Exam. Examples of past proposals are on the student Wiki.

c) ORAL QUALIFYING EXAM AND RESULTS FORM *(Wtr, 3rd yr)*
The Oral Qualifying Exam must be successfully completed by the end of Winter Quarter in the third year. In the Oral Qualifying Exam, students are expected to demonstrate depth in two distinct Fields of Inquiry, as well as interdisciplinary breadth. The Oral Qualifying Exam consists of two parts: a 20-40 minute presentation of the student's dissertation proposal and a "question and answer" period where the student should be prepared to answer questions about the proposal, issues related to the proposal, and broader questions arising from E-IPER coursework. The total procedure is a closed session and lasts approximately two to two and a half hours.

Committee attendance and exam results are recorded using the **Qualifying Exam Results Form**, which the student should bring to the Exam. The student may also want to bring other forms for his/her Committee to review and sign, including any outstanding forms such as the **Breadth Certification Form** and **Fields of Inquiry Certification Form**, both of which are required before a student may apply for TGR status (see below).

2) AFTER THE QUALIFYING EXAM

a) APPLYING FOR CANDIDACY

Students who have completed 25 graded units at the 200-level or above, maintaining a 3.0 GPA, and who have passed the Oral Qualifying Exam are eligible for admission to Candidacy. Eligible students apply for and are advanced to Candidacy immediately after they pass the Oral Qualifying Exam and submit all relevant forms.

b) REACHING TERMINAL GRADUATE REGISTRATION (TGR) STATUS

Students are expected to go TGR as soon as they are eligible, but no later than Autumn Quarter of the fourth year; many students will be eligible and should apply in the quarter following the Oral Qualifying Exam. E-IPER staff may require justification for additional coursework following the Oral Qualifying Exam. To be eligible for TGR status, a student must have completed all requirements for the PhD with the exception of the dissertation and University Oral Exam (dissertation defense). The student will have completed all required coursework, passed the Oral Qualifying Exam, and been advanced to Candidacy. Once TGR, students are permitted to take up to 3 units per quarter provided the class/units are not used to fulfill any degree requirement. The **Request for Terminal Graduate Registration Status** form is available from the University Registrar's website. The **Doctoral Dissertation Reading Committee** form (also a University Registrar form) must be submitted at the same time, but can be easily amended if there are subsequent changes to the dissertation readers. TGR paperwork must be submitted no later than the first day of the quarter in which TGR status is requested.

c) ANNUAL REVIEW

If passed, the Oral Qualifying Exam serves as a component of the Annual Review (see section VI. Student Annual Review). Students are required to submit the modified Annual Review form specifically for third year students, which seeks information not captured by Qualifying Exam related paperwork. However, given the level of interaction preparing for the Oral Qualifying exam entails, advisors are not required to report on the student's annual progress.

D. FOURTH YEAR AND BEYOND

1) UNIVERSITY ORAL EXAM

(NOTE: Most of this section was taken from the 2011-2012 Stanford Bulletin and is standard University policy that may be updated annually. The latest version of the Bulletin should be referred to for current policies.)

Passing a University oral examination in defense of the dissertation is a requirement of the PhD. degree. The purpose of the exam is to test the candidate's command of the field and confirm fitness for scholarly pursuits. Students must be registered in the term in which the University oral exam is taken and candidacy must be valid.

The **University Oral Examination Committee** consists of at least five Stanford faculty members: four examiners and the committee chair. The Chair's expertise must be outside of the student's two Fields of Inquiry and may not be appointed in the same department as either Lead Advisor. All members are normally on the Stanford Academic Council and the Chair must also be a member. Using the **Petition for Doctoral Committee Members Form**, E-IPER's Faculty Director may approve the appointment of an

examining member who is not on the Academic Council if that person contributes an area of expertise that is not readily available from the faculty. The member must hold a PhD or equivalent foreign degree. The University Oral Examination Committee may or may not be the same as the student's Oral Qualifying Exam Committee, but must include the student's two Lead Advisors.

The **University Oral Examination Form** must be reviewed by E-IPER's Associate Director and submitted to E-IPER's Student Services Manager at least two weeks prior to the proposed examination date. The examination format is determined by the University Oral Examination Committee, but should not exceed three hours in length and it must include a period of private questioning by the examining committee. The candidate passes the examination if the examining committee casts four favorable votes out of five or six, five favorable votes out of seven, or six favorable votes out of eight. Five members present and voting constitute a quorum.

In the interest of timing and with approval from his/her Lead Advisors and the Associate Director, the student may sit for his/her Oral Examination before the final draft of the dissertation has been approved. The student must be registered TGR during the quarter he/she sits for the Oral Examination but may apply for and register at a greatly reduced tuition rate for a "graduation quarter" during the quarter he/she submits the final dissertation. In other words, the examination and submission of the dissertation may in some circumstances occur in different quarters.

2) DISSERTATION

An approved doctoral dissertation is required for the PhD. The dissertation must be an original contribution to scholarship or scientific knowledge, should integrate problem-oriented research from two distinct Fields of Inquiry, and must exemplify the highest standards of interdisciplinary research. There are several possible models for an E-IPER dissertation, including three to four loosely tied chapters that are publishable as stand-alone papers, a book model, or a format in between. The Dissertation Reading Committee, especially the student's Lead Advisors, will aid the student in framing the dissertation research within an agreed upon model. The two Lead Advisors will ensure that the student's research sufficiently explores and integrates the two chosen Fields of Inquiry.

The dissertation is read and evaluated by a **Dissertation Reading Committee**, normally a subset of the **University Oral Exam Committee** including the Lead Advisors and at least one additional reader. Normally, all members are on the Academic Council. Using the **Petition for Doctoral Committee Members Form**, E-IPER's Faculty Director may approve the appointment of a reader who is not on the Academic Council if that person is well qualified to consult on the dissertation topic and holds a Ph.D. or equivalent foreign degree. Former Stanford Academic Council members and emeritus professors may serve on the Reading Committee. The Reading Committee is proposed by the student and endorsed by E-IPER's Faculty Director using the **Doctoral Dissertation Reading Committee Form**. This form is submitted before the approval of Terminal Graduate Registration (TGR) status or before scheduling the University Oral Examination in defense of the dissertation. Any subsequent changes to the reading committee must be approved by E-IPER's faculty director using the **Change of Advisor or Reading Committee Member Form**.

Each Dissertation Reading Committee member signs the signature page of the dissertation to certify that the work is of acceptable scope and quality. One Reading Committee member reads the dissertation in its final form and certifies on the **Certificate of Final Reading** (found in the Office of the University Registrar publication, *Directions for Preparing Doctoral Dissertations*, or online through Axess for Faculty when the dissertation is submitted electronically) that Program and University specifications have been met. The signed dissertation copies and accompanying documents must be submitted to the Office of the University Registrar, or through Axess when the dissertation is submitted electronically, on or before the quarterly deadline indicated in the University's academic calendar. In addition, it is mandatory that all

doctoral dissertation submissions be accompanied by the **Doctoral Dissertation Agreement Form**, which is part of the ProQuest handbook, *How to Submit a Dissertation*, available from the Office of the University Registrar.

Students must either be registered or on Graduation Quarter in the term they submit the dissertation. At the time the dissertation is submitted, an Application to Graduate must be on file (filed on Axess), all of the program requirements must be complete, and Candidacy must be valid through the term of degree conferral.

3) **ANNUAL REVIEW**
Students who have been admitted to Candidacy complete a generalized "Post-Quals" Annual Review Form each spring until they successfully defend their dissertation (see Section VI. Student Annual Review). Students must attach a thesis outline and quarterly timeline to degree completion, which includes funding prospects for quarters beyond E-IPER Fellowship eligibility. It is recommended that advanced students convene their full committee at least annually to discuss the annual review form and accompanying timeline and outline to ensure that all members of the committee are in agreement on the student's dissertation progress.

III. TEACHING

For educational purposes, each student is required to complete at least one quarter of teaching. This can be fulfilled by serving as a teaching assistant (TA) for ENVRES 320 or ENVRES 330, or by serving as a TA for any other course, in any department or program, with a discussion section or with an opportunity (that E-IPER TA's are expected to seize!) to lecture in at least two class sessions. Seminars, including Introductory Seminars, may not be used to fulfill the teaching requirement. It is recommended that the teaching requirement is fulfilled by the end of the third year unless the student has a firm commitment from a faculty member to TA a future course. If possible, TAs should be sure they are assigned to a separate discussion section so they will receive official University student evaluations separate from the faculty instructor(s). Upon completion, the TA must obtain the instructor's signature on the **Teaching Requirement Certification Form**, and submit it to the Student Services Manager. To obtain more substantive feedback on their teaching, TAs may opt to distribute E-IPER's **Teaching Assistant Evaluation Form**, available on E-IPER's Academic Resources webpage, to both the supervising instructor and the class participants. Students are encouraged to take advantage of opportunities to gain further teaching experience beyond the required one quarter and to develop a teaching portfolio that might contribute to their future job search. Additional teaching information and resources are on the E-IPER website.

IV. OTHER PROGRAM REQUIREMENTS

All students are required to submit, on an ongoing basis, grant proposals for external funding, defined as fellowship and/or research funds provided by a government agency (e.g., the US National Science Foundation or Environmental Protection Agency), a private foundation (e.g., the Switzer Foundation), or a University entity (e.g. the VPGE's SIGF or DARE Fellowships). A list of possible fellowships to consider is online at: http://pangea.stanford.edu/programs/eiper/resources/financial-resources. Students who are supported by an E-IPER fellowship, or receive supplemental funding in the form of E-IPER or SES summer grants, have an important stewardship role to play. Recipients are required to write thank-you letters, provide progress and/or accounting reports, and/or attend specific donor-recognition activities at the behest of E-IPER, the SES Dean's Office and the University's Development Office.

V. "OPTING OUT" WITH A MASTERS OF SCIENCE DEGREE

In exceptional circumstances, E-IPER offers a Master of Science degree for students who have been admitted to the E-IPER PhD program but who opt to complete their training with a MS degree. Admission directly to the stand-alone MS program is not allowed. A student who has attended Stanford

for at least one term and who is currently enrolled or on an approved leave of absence may, with his/her two Lead Advisors' consent, submit a Graduate Program Authorization Petition on Axess to make the degree change. International students changing degree programs must also obtain the approval of the Foreign Student Advisor at the Bechtel International Center.

MS course work should total at least 45 units at or above the 100-level, of which the majority of units should be at or above the 200-level. Masters students will normally take the E-IPER core curriculum for PhD students, comprising ENVRES 310, Environmental Forum Seminar; ENVRES 315, Environmental Research Design Seminar; ENVRES 320, Designing Environmental Research; and ENVRES 330, Research Approaches for Environmental Problem Solving.

In addition, students plan a sequence of courses with a focus in a particular area of study, corresponding to E-IPER's four Focal Areas: Culture and Institutions; Economics and Policy Analysis; Engineering and Technology; and Natural Sciences.

A program proposal, signed by the student's Lead Advisors and approved by E-IPER's Faculty Director, must be filed within the first four weeks of the quarter in which the student switched from the PhD to the MS. Students may take no more than 6 units credit/no credit and must maintain at least a "B" average in all courses taken for the MS degree. The MS program does not have an MS with thesis option. Students may write a Master's thesis, but it will not be formally recognized by the University. A student who opts to complete the MS instead of the PhD is typically eligible for one additional quarter of tuition and stipend support.

VI. STUDENT ANNUAL REVIEW

E-IPER's Annual Review process is intended to make it easier for students to communicate their needs, progress, accomplishments, and concerns to their advisors and to the Program, and to receive feedback directly from their advisors. The process also clarifies requirements, milestones, forms, and deadlines; enables the Program to understand student progress and needs more deeply; facilitates communication between advisors and E-IPER staff and leadership; and provides a mechanism through which students and faculty can give feedback on the Program's overall effectiveness.

As described in Section II. Year-by-Year Advising and Milestones, students complete the **Student Annual Review Form** specific to their year, and the Lead Advisors complete Section D of the student's form. Forms will be made available at the beginning of Spring Quarter and are generally due in early May, so they can be reviewed and compiled in preparation for the Academic Guidance Committee's annual year-end meeting. At that meeting, the Academic Guidance Committee (which includes all faculty advising 2 or more E-IPER students, and all faculty teaching E-IPER core courses) will discuss the progress of each student (and advisory committee). Similar "committee of the whole" meetings take place in most academic departments. First year students should bring the completed form for discussion to their Big Picture Advising Session; second year students should bring the completed form for discussion to the Meeting of the Minds; third year students, having just gone through the qualifying procedure, complete a modified form which does not require advisor participation. The Annual Review of students who have been admitted to candidacy is not coupled with any particular milestone or meeting; however, advanced students are encouraged to meet with at least their Lead Advisors *together* to ensure progress and agreement about the scope of the student's dissertation research.

Because Annual Reviews are crucial to the annual assessment of the program, timely submission is required. If an extension of any kind (i.e. First Year Big Picture or Second Year Meeting of the Minds sessions, forms, milestones, the Annual Review) is needed, the E-IPER Associate Director or Student Services Manager must be contacted to make arrangements in advance of the Annual Review due date.

It is the goal that the face-to-face student-faculty discussions which the Annual Review process intends to foster will provide an opportunity to reflect on the past year, to think about the next, and to ensure that students and their advisors are in agreement about progress. Students and their advisors are to submit their reviews to one another directly, ensuring that E-IPER staff receive a copy of all reports by the established deadlines. E-IPER's Academic Guidance Committee, comprising E-IPER advisors and other core affiliated faculty members, assesses students' progress and provides guidance and recommendations in this regard. They have an interest in seeing the overall degree progress of the E-IPER student body and must be privy to individual cases of concern so they can work with staff, the student, and the student's advisors to devise solutions to the issue(s) in a collaborative manner. Annual Review forms can be accessed from the E-IPER's Academic Resources webpage.

VII. MONITORING DEGREE PROGRESS

Both E-IPER and University milestones and requirements are instituted to ensure that every student makes excellent progress toward earning the PhD. These milestones and requirements were carefully designed, with due dates strategically spaced to assist students in staying on track with their coursework, faculty and committee interactions, research, dissertation writing, and finally, graduation. It is therefore crucial that students comply with all established deadlines as defined in the E-IPER Requirements Document and the Stanford Bulletin.

While the requirements and milestones provide a universal structure, we recognize that students' progress will vary based on selected disciplines, research scope, and alignment with faculty, and therefore exceptions may be granted with justification. If a student is unable to meet particular deadlines or complete his/her Annual Review by the end of Spring Quarter, it is his/her responsibility to discuss the situation and alternative deadlines with his/her advisors and the E-IPER staff. In some cases E-IPER's Faculty Director and/or Executive Committee may need to approve alternative timelines or extensions. Should a student miss one or more deadlines and fail to communicate with E-IPER staff, the Faculty Director and/or Executive Committee may initiate further disciplinary action, such as withholding the student's stipend, contacting his/her advisors directly, or placing a disciplinary letter in the student's file. However, given the Program's small size and availability of the staff and faculty leaders, such extreme actions are expected to be rare and applied only when a student is blatantly disregarding Program expectations.

E-IPER has a clear process in place by which faculty, staff, or the Executive Committee itself can take action in those rare cases in which a student is far off track and uncommunicative about his/her plans. To tie milestones with potential outcomes simply and in a format easily understood by faculty involved in the Annual Review process, the year-by-year milestones and requirements are outlined below along with potential consequences of not meeting specific milestones. This may also serve as a simple checklist for students after they thoroughly read through the detailed descriptions of each milestone in the sections above. It should be noted that, as stated above and throughout this document, E-IPER is flexible within reason - students should discuss alternative plans or schedules with their advisors and the E-IPER staff well in advance of the Annual Review so accommodations can be made.

Given the programmatic value of the Annual Review process, and the importance of its role in individual degree progress monitoring, it is imperative that the Student Annual Review Form and all accompanying degree progress forms are submitted by the Annual Review deadline.

1st Year

- Coursework
- completion of core courses (ENVRES 310, 315, 320, 330)

- no incompletes on transcript without explanation from relevant faculty *(work must be completed within the timeline allowed by the University or student will be placed on academic warning, consisting of a letter from the Faculty Director placed in the student's file)*

- Advising
- completion of at least two First Year Advising meetings (beginning of autumn and winter quarter)
- completion of First Year Big Picture advising meeting in spring quarter and submission of accompanying meeting agenda to staff

- Annual Review
- submission of student Annual Review form, discussed at First Year Big Picture Meeting (*student section of Annual Review due even if approval for postponing the Big Picture meeting is granted.)*

- Summer Quarter
- First Year students who do not submit an E-IPER or SES Summer Grant proposal will be required to include a more detailed written description of their summer plans on their Annual Review Form. Those submitting a summer grant proposal can summarize their plans on the Annual Review form in just a few sentences.

  NOTE: Students whose summer research was funded by E-IPER or SES will be required to submit a written report to E-IPER and their First Year Advisors in the following autumn quarter.

2nd Year

- Advising
- Selection of Fields of Inquiry and Lead Advisors and submission of relevant forms by the first two weeks of spring quarter
- Second Year Meeting of the Minds by end of spring quarter, to include:
  1. A 10-15 minute oral student presentation of his/her Candidacy Plan
  2. A review of the student's draft Candidacy Plan
  3. Determination, from the student's presentation and these documents, that the student is making sufficient progress to take the Oral Qualifying Exam by end of winter quarter of the third year. This is recorded in the advisor section of the Annual Review form, and by the first two weeks of winter quarter, on the student's Qualifying Eligibility and Committee Designation Form.

  There are three possible outcomes from the Second Year Meeting of the Minds:
  1) Student passes to next year if sufficient progress has been made and the student is on track to qualify by the next winter quarter.
  2) If faculty raise concerns about a student's progress and preparation for the Oral Qualifying Exam, the student may be placed on academic warning and a plan developed to address faculty concerns prior to the Oral Qualifying Exam deadline or to create an alternative qualifying schedule (not to go beyond Year 3).
  3) If the student has made insufficient progress, dismissal from the program is a possible outcome. The student may be advised not to proceed to the Oral Qualifying Exam and to leave the program with an MS. If this is the outcome, the student may be allowed one additional quarter of tuition and stipend support.

- Final Candidacy Plan to be submitted before end of spring quarter.

- Annual Review

- submission of Annual Review form, addressed at Second Year Meeting of the Minds (*student section of Annual Review due even if approval for postponing the Meeting of the Minds is granted.)*

- Summer Quarter
- Second Year students who do not submit an E-IPER or SES Summer Grant proposal will be required to include a more detailed written description of their summer plans on their Annual Review Form. Those submitting a summer grant proposal can summarize their plans on the Annual Review form in just a few sentences

  NOTE: Students whose summer research was funded by E-IPER or SES will be required to submit a written report to E-IPER and their Lead Advisors in the following autumn quarter.

3rd Year

- Oral Qualifying Exam (by end of winter quarter)

There are three possible outcomes to the Qualifying Exam
1) Exam passed and dissertation proposal approved.
2) Conditional pass with revisions required. Committee should specify what the student needs to do to receive a pass, a timeline for completion (not to exceed one quarter) and whether an additional meeting/exam is required to review student's revised proposal.
3) Exam not passed. Committee should specify in writing to the Faculty Director and student, within one week, their rationale for failing the student. Failure of the qualifying exam may result in dismissal from the PhD program. A student may appeal the decision following the procedures outlined by the School of Earth Sciences, which are available from the Faculty Director or Associate Director.

- Coursework
- breadth course requirements completed and certification form submitted
- application to go TGR submitted or justification for more coursework accepted by staff and advisors

- TA Requirement
- completion recommended by end of Year 3 (if not complete, recommend that student has firm commitment from faculty to TA future course)

- Summer Quarter
- written plans for supervised summer research required only if seeking research funds from E-IPER/SES via the regular process. Expectation is that members of student's Oral Qualifying Committee will oversee dissertation research once exam is passed.

- Annual Review
- only student summary section required; Oral Qualifying Exam serves as advisor review

4th Year and Beyond

- Advising
- It is expected that the student will convene his/her full committee at least annually to discuss research and dissertation progress.

- Annual Review

- submission of Annual Review form from student and Lead Advisors to include a thesis outline and approximate timeline to degree, and certification from advisors that outline and timeline is feasible . If it is anticipated that the student will take more than five years to complete his/her dissertation, a plan for securing funding for additional funds should be included here.

APPENDIX I: COURSES APPROVED TO FULFILL BREADTH IN E-IPER'S FOUR FOCAL AREAS
(updated July 2011)

The following courses may be taken to satisfy the breadth requirement in E-IPER's four focal areas. Students should consult the current year's Bulletin and Explore Courses web site to determine which courses are available this year.

CULTURE AND INSTITUTIONS
At least two courses are required. Students may choose a course not listed below provided it meets the criteria for this focal area's subject knowledge. Students are advised to seek approval from their lead advisers in advance and are required to obtain their advisers' signatures on the breadth certification form as verification that they have met this requirement.

ANTHRO 247. Nature, Culture, Heritage
ANTHRO 262. Indigenous Peoples and Environmental Problems
CEE 265D. Water and Sanitation in Developing Countries
CEE 275 A. Law and Science of California Coastal Policy
CEE 277C. Environmental Governance
EARTHSYS 112. Human Society and Global Change
EARTHSYS 224. Environmental Justice: Local, National, and International Dimensions
ECON 228. Institutions and Organizations in Historical Perspective
EDUC 291X. Introduction to Survey Research
EDUC 332X. Theory and Practice of Environmental Education
EDUC 371X. Social Psychology and Social Change
HISTORY 376. Modern Brazil
LAW 280. Toxic Harms
LAW 306. Law, Economics and Politics of International Trade
LAW 338. Land Use
LAW 437. Water Law and Policy
LAW 603. Environmental Law and Policy
LAW 604. Environmental Law Workshop
LAW 656. International Conflict: Management and Resolution
MS&E 252. Decision Analysis I: Foundation of Decision Analysis
MS&E 383. Doctoral Seminar on Ethnographic Research
POLISCI 351A. Foundations of Political Economy
POLISCI 364. Theories of Political Institutions
POLISCI 440A. Theories in Comparative Politics
POLISCI 440B. Political Economy of Development
POLISCI 440C. Methods in Comparative Politics
POLISCI 444. Comparative Political Economy: Advanced Industrial Societies
PSYCH 223. Social Norms
PUBLPOL 194. Technology Policy
PUBPOL 202. Organizations and Public Policy
SOC 260. Formal Organizations
SOC 314. Economic Sociology
SOC 318. Social Movement and Collective Action
SOC 320. Foundations of Social Psychology
SOC 362. Organization and Environment
SOC 363A. Seminar on Organizational Theory
SOC 363B. Seminar on Organizational Theory: Institutional Analysis
SOC 366. Organization Studies: Theories and Analysis

SOC 367. Institutional Analysis of Organizations
SOC 377. Comparing Institutional Forms: Public, Private, and Nonprofit

ECONOMICS AND POLICY ANALYSIS
One of the prescribed course series listed below, OR at least one "intermediate" course and one "advanced" course as defined below, satisfies the minimum breadth requirement. Note that any necessary prerequisites (e.g. ECON 50, 51) are additions to the possible sequences below. Students are advised to seek approval from their lead advisers in advance and are required to obtain their advisers' signatures on the Breadth Certification Form as verification that they have met this requirement.

Core Economics Series (regular or "N" series for non-economics PHD students)
ECON 202. Core Economics: Modules 1&2
ECON 203. Core Economics: Modules 5&6
ECON 204. Core Economics: Modules 9&10
OR
Public Policy Series
PUBPOL 301A. Microeconomics
PUBLPOL 301B. Cost-Benefit Analysis and Evaluation
OR
Management Science & Engineering Series
MS&E 241. Economic Analysis
MS&E 341. Advanced Economic Analysis

OR at least one "intermediate" course and at least one "advanced" course from the lists below:

Intermediate Courses
ECON 106. World Food Economy
ECON 118. Development Economics
ECON 155. Environmental Economics and Policy
MS&E 248. Economics of Natural Resources
PUBLPOL 202. Organizations and Public Policy
PUBLPOL 204. Economic Policy Analysis
PUBLPOL 302B. Introduction to Economic Analysis of Law

Advanced Courses
ECON 250. Environmental Economics
ECON 251. Natural Resource and Energy Economics
MS&E 243. Energy and Environmental Policy Analysis

Students who choose economics and/or policy analysis as a Field of Inquiry are expected to complete one of the prescribed series in addition to taking one or more of the advanced courses listed above.

ENGINEERING AND TECHNOLOGY
At least one course is required; this list represents examples of appropriate courses only. Students may choose a course not listed below provided it meets the criteria for this focal area's subject knowledge. Students are advised to seek approval from their lead advisers in advance and are required to obtain their advisers' signatures on the breadth certification form as verification that they have met this requirement.

CEE 101B. Mechanics of Fluids
CEE 161A. Rivers, Streams, and Canals

CEE 172. Air Quality Management
CEE 176A. Energy Efficient Buildings
CEE 176B. Electric Power: Renewables and Efficiency
CEE 177. Aquatic Chemistry and Biology
CEE 201D. Computations in Civil and Environmental Engineering
CEE 207A. Energy Resources
CEE 210. Building Information Modeling
CEE 215. Goals and Methods of Sustainable Building Projects
CEE 229. Climate Change Adaptation for Seaports: Engineering and Policy for a Sustainable Future
CEE 260A. Physical Hydrogeology
CEE 262B. Transport and Mixing in Surface Water Flows
CEE 263A. Air Pollution Modeling
CEE 264A. Rivers, Streams, and Canals
CEE 265A. Sustainable Water Resources Development
CEE 266B. Floods and Droughts, Dams and Aqueducts
CEE 270. Movement and Fate of Organic Contaminants in Surface Waters and Groundwater
CEE 275A. Law and Science of California Coastal Policy
EE 293A or 293B. Fundamentals of Energy Processes
EESS 211. Fundamentals of Modeling
HIST 401A. Spatial History
MS&E 250A. Engineering Risk Analysis

NATURAL SCIENCES
At least two courses are required. Students may choose a course not listed below provided it meets the criteria for this focal area's subject knowledge. Students are advised to seek approval from their lead advisors in advanced and are required to obtain their adviser's signatures on the breadth certification form as verification that they have met this requirement.

BIO 101. Ecology
BIO 102. Demography: Health, Development, Environment
BIO 117. Biology and Global Change
BIO 121. Biogeography
BIO 136. Evolutionary Paleobiology
BIO 139. Biology of Birds
BIO 144. Conservation Biology
BIO 175. Tropical Ecology and Conservation
BIO 216. Terrestrial Biogeochemistry
BIO 227. Foundations of Community Ecology
BIO 264. Biosphere-Atmosphere Interactions
BIOHOPK 263H. Oceanic Biology
BIOHOPK 266H. Molecular Ecology
BIOHOPK 272H. Marine Ecology
CEE 164. Introduction to Physical Oceanography
CEE 266A. Watersheds and Wetlands
CEE 272. Coastal Contaminants
CEE 274A. Environmental Microbiology I
CEE 274B. Environmental Microbiology II
CEE 274P. Environmental Health Microbiology Lab
CEE 275A. Law and Science of California Coastal Policy
EARTHSYS. 208. Coastal Wetlands-
EARTHSYS 247. Controlling Climate Change in the 21st Century

EESS 143. Marine Biogeochemistry
EESS 155. Science of Soils
EESS 262. Remote Sensing of Land
EESS 164. Fundamentals of Geographic Information Science (GIS)
EESS 215. Earth Systems Dynamics
EESS 220. Physical Hydrogeology
EESS 240. Advanced Oceanography
EESS 241. Remote Sensing of the Oceans
EESS 246A. Atmosphere, Ocean and Climate Dynamics: The Atmospheric Circulation
EESS 246B. Atmosphere, Ocean and Climate Dynamics: The Ocean Circulation
EESS 256. Soil and Water Chemistry
EESS 258. Geomicrobiology
EESS 259. Environmental Microbial Genomics
EESS 284. Climate and Agriculture
GEOPHYS 104. The Water Course
GEOPHYS 130. Biological Oceanography
GES 170. Environmental Geochemistry