ENERGY GRADUATE GROUP
M.S. AND Ph.D. DEGREE REQUIREMENTS
Submitted: November 25, 2014
Graduate Council Approval:______________

Master’s Degree Requirements

1) Admissions requirements:
Admissions decisions will be made on a case-by-case basis according to the following timeline:

Priority Deadline: January 1 (priority given for fellowships)
General Deadline: March 15
Final Deadline: May 31 (space permitting)

Applicants will be notified of admissions decisions within approximately 30 to 45 days after the application deadline. Meeting some or all of the admissions criteria outlined below does not guarantee admission, but merely confirms eligibility. The decision to recommend admission to the Dean of Graduate Studies will be made by the Student Admissions and Membership Committee of the Energy Graduate Group on the basis of available space and the competitiveness of applicants.

All applicants must complete the current “UC Davis Graduate Application” available online through the UC Davis Office of Graduate Studies and submit the required application fee. That online application will require applicants to provide:

Basic Information
Personal Information
Plans for Graduate Study
U.S. Citizens and Permanent Residents
Academic History
Other Information
Test Scores
Statement of Purpose / Personal History Statement
Data Verification
Recommendations

In addition to completing the “UC Davis Graduate Application” online, the following criteria are required for admission to the Energy Graduate Group:

Undergraduate Degree. Consideration for program admission requires a bachelor’s degree from an accredited institution. Strong applicants to the program who intend to pursue a degree in Energy Science & Technology will likely have received an undergraduate degree in engineering, mathematics, the physical sciences, or a related field. Strong applicants to the program who intend to pursue a degree in Energy Policy & Management will likely have received an undergraduate degree in economics, political science, policy, planning, management, or a related field.

Minimum GPA. A minimum GPA of 3.0 in the applicant’s undergraduate program and in any prior graduate program is required.

Letters of Recommendation. Applicants will be required to submit three letters of recommendation through the online “UC Davis Graduate Application.” Applicants are
encouraged to submit professional letters of recommendation, but at least one letter
should be from a professor who can assess your potential for advanced academic work.

**Official Transcripts.** Applicants will be required to submit official transcripts from any
previous institution of higher education attended. This requirement is in addition to
reporting degrees awarded and GPA attained on the online “UC Davis Graduate
Application.”

**Resume (optional).** Applicants are encouraged to submit a current resume that reflects
work experience, academic track record, and any other relevant information.

**Statement of Purpose.** All applicants are required to complete the Statement of
Purpose required on the online “UC Davis Graduate Application.”

**Personal History Statement.** All applicants are required to complete the Personal
History Statement required on the online “UC Davis Graduate Application.”

**GRE Scores.** Applicants will be required to submit official GRE General Test scores
from within the last 5 years. This requirement is in addition to self-reporting GRE test
scores on the online “UC Davis Graduate Application.” Competitive applicants will report
strong overall GRE scores. For the Energy Science & Technology degree track, most
successful applicants will have a very strong GRE Quantitative Reasoning score. For the
Energy Policy & Management degree track, most successful applicants will have a very
strong GRE Verbal Reasoning score.

**Application and Fee.** All applicants will be required to complete the Office of Graduate
Studies online “UC Davis Graduate Application” application and to remit the
accompanying application fee by the stated admission deadline.

**Research Interests.** Applicants are required to list three areas of potential research
interest within the energy field. Please use only one to five words to describe each
interest.

**Faculty Mentor.** Applicants are required to list three potential faculty mentors on the
basis of his/her research interests. Applicants are strongly encouraged to communicate
with potential research advisors (Major Professors) prior to admission to the Energy
Graduate Group. Ideally, this process of communicating with potential Major Professors
should begin no later than in the Fall prior to anticipated enrollment. Applicants should
take the initiative to inquire about future research directions of specific faculty at UC
Davis, exchange research ideas with potential Major Professors, and make an effort to
identify viable possibilities. To assist applicants, the UC Davis Energy Institute will
maintain a website that identifies faculty affiliated with the Energy Graduate Group and
notes their area(s) of expertise.

**TOEFL/IELTS Requirements.** The program will follow the policies of the UC Davis
Graduate Council for evaluation of international applicants. TOEFL or IELTS scores
must be submitted to demonstrate English language proficiency for international
applicants who have not studied at an institution where the language of instruction was
in English. International applicants must meet the Office of Graduate Studies minimum
score requirement.

a) **Prerequisites:**

In addition to the admission requirements stated above, applicants are expected to
have passed the equivalent of the following UC Davis courses:

All EGG students, regardless of track, must have completed at least one of the
following courses in upper division Statistics (or its equivalent) and must have
completed the following two courses in Calculus (or their equivalent):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 102</td>
<td>Introduction to Probability Modeling and Inference</td>
<td>4 units</td>
</tr>
<tr>
<td>STA 103</td>
<td>Applied Statistics for Business and Economics</td>
<td>4 units</td>
</tr>
</tbody>
</table>
For the Energy Science & Technology track, applicants must have an undergraduate or graduate degree in Engineering from an accredited institution, or have completed at least two of the following courses (or their equivalent):

- CHE 110A Physical Chemistry: Introduction 4 units
- CHE 124A Inorganic Chemistry: Fundamentals 4 units
- CHE 128A Organic Chemistry 4 units
- PHY 110A Electricity and Magnetism 4 units
- PHY 140A Introduction to Solid State Physics 4 units

For the Energy Policy & Management track, applicants must have completed the following course (or its equivalent):

- ECN 100 Intermediate Microeconomic Theory 4 units

b) Deficiencies:

Pre-requisite coursework deficiencies must be taken for a letter-grade and are expected to be completed by the time the student files for advancement to candidacy.

2) M.S. Plan I or Plan II

At the Master’s level, the Energy Graduate Group will offer students the option of completing either a Plan I or Plan II Master’s Degree. The M.S. need not be a terminal degree, but can be part of the path to a Ph.D. The program will offer the Plan B option for completing a Ph.D.

Students will pursue one of the following plans for fulfillment of the requirements for the Master’s degree. Students will identify in coordination with the Major Professor which plan they intend to pursue upon enrollment in the program.

**Plan I (Thesis).** This plan requires a minimum of 36 units of graduate and upper division courses (the 100 and 200 series only), of which at least 18 of the 36 units must be graduate work in the major field. All graduate courses must be passed with a letter grade of “B” or higher. In addition, a thesis or a project in lieu of a thesis is required. This research thesis or project will serve as the capstone requirement for the degree. A minimum of 3 units and a maximum of 6 units of EGG 299 research units may count toward this 36 unit requirement for the degree for M.S. Plan I students. The student is subject to guidance by the major program regarding the distribution of his or her work.

A minimum of three quarters of academic residence is required.

This Plan requires more units than the UC Davis minimum, which are: 30 units of graduate and upper division courses (the 100 and 200 series only), at least 12 of which must be graduate work in the major field.

**Plan II (Comprehensive Examination).** This plan requires a minimum of 38 units of graduate and upper division courses (the 100 and 200 series only), of which at least 20 units must be graduate courses in the major field. All graduate courses must be passed with a letter grade of “B” or higher. A comprehensive final examination in the major subject, of such nature and conducted in such manner as may be determined by the program concerned, is required of each candidate. No thesis is required. The capstone requirement is fulfilled by the candidate’s successful completion of the comprehensive examination.
A minimum of three quarters of academic residence is required.

This Plan requires more units than the UC Davis minimum M.S. Plan II, which are: 36 units of graduate and upper division courses (the 100 and 200 series only), at least 18 of which must be graduate courses in the major field. Not more than 9 units of research (299 or equivalent) may be used to satisfy the 18 unit requirement.

3) Course Requirements – Core, Sub-Core, and Electives (minimum of 36 units)

M.S. students will be required to complete four Core Courses, and will be required to enroll in EGG 290 Energy Seminar in the Fall Quarter of their first and second years of the program. Additionally, M.S. students will be required to take an additional two courses (minimum of 6 units) from among a list of pre-approved Sub-Core Courses designed to give the student a strong foundation in their chosen degree track (either Energy Science & Technology, or Energy Policy & Management). The remaining units required for the student to achieve the minimum of 36 units required for the degree will be determined by a course of study developed by the student in coordination with their Major Professor that is designed to provide the student with a specialization within the energy field. Sufficient EGG 299 research units must also be taken so that an M.S. Plan I student can write an acceptable thesis.

a) **Core Courses (13 units)**

- EGG 200 Introduction to Energy Science and Technology 4 units
- EGG 201 Life-Cycle Analysis of Energy Systems 4 units
- EGG 202 Energy and Climate Policy 3 units
- EGG 290 Energy Seminar 1 unit (x2)

b) **Sub-Core Foundation Courses (6 to 8 units)**

In addition to the “Core Requirements” above, all students will be required to take at least two courses (minimum 6 units) in a foundation area. At least one course (minimum 3 units) taken to fulfill the Sub-Core foundation requirement must be taken at the graduate level, while the other may be upper division. Students in the Energy Science & Technology track will be required to take courses in either (a) Engineering and Technology or (b) Energy Sciences to fulfill this requirement. Students in the Energy Policy & Management track will be required to take courses in Policy & Management to fulfill this requirement.

**Engineering and Technology**

- DES 136A Lighting Technology and Design 4 units
- EBS 218 Solar Thermal Engineering 4 units
- EBS 265 Design and Analysis of Engineering Experiments 5 units
- ECE 216 Low Power Digital Integrated Circuit Design 3 units
- ECE 284 Design and Optimization of Embedded Computing Sys. 4 units
- ECI 125 Building Energy Performance 4 units
- ECI 143 Green Engineering Design and Sustainability 4 units
- ECI 268 Infrastructure Economics 3 units
- EME 106 Thermo-Fluid Dynamics 4 units
- EME 163 Internal Combustion Engines and Future Alternatives 4 units
- EMS 170 Sustainable Energy Technology: Batteries, Fuel Cell, PV 4 units
- ENG 160 Environmental Physics and Society 3 units
- MAE 216 Advanced Thermodynamics 4 units
- MAE 217 Combustion 4 units
- MAE 218 Advanced Energy Systems 4 units
- MAE 258 Hybrid Electric Vehicle System Theory and Design 4 units
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 268</td>
<td>Wind Power Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MAE 269</td>
<td>Fuel Cell Systems</td>
<td>4</td>
</tr>
<tr>
<td>MAE 271</td>
<td>Advanced Modeling and Simulation of Mechatronic Sys.</td>
<td>4</td>
</tr>
<tr>
<td>MAE 272</td>
<td>Theory and Design of Control Systems</td>
<td>4</td>
</tr>
</tbody>
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**Energy Sciences**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ATM 116</td>
<td>Climate Change</td>
<td>4</td>
</tr>
<tr>
<td>ATM 149</td>
<td>Air Pollution (same as ECI 149)</td>
<td>4</td>
</tr>
<tr>
<td>CHE 205</td>
<td>Symmetry, Spectroscopy, and Structure</td>
<td>3</td>
</tr>
<tr>
<td>CHE 226</td>
<td>Principles of Transition Metal Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 228C</td>
<td>Solid-State Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 228D</td>
<td>Homogenous Catalysis</td>
<td>3</td>
</tr>
<tr>
<td>CHE 241D</td>
<td>Electroanalytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>EBS 267</td>
<td>Renewable Bioprocessing</td>
<td>3</td>
</tr>
<tr>
<td>EBS 270</td>
<td>Modeling and Analysis of Biological and Physical Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECI 241</td>
<td>Environmental Reactive Chemical Transport Modeling</td>
<td>4</td>
</tr>
<tr>
<td>ETX 203</td>
<td>Environmental Toxicants</td>
<td>4</td>
</tr>
<tr>
<td>FST 205</td>
<td>Industrial Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 214</td>
<td>Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 263</td>
<td>Biotechnology Fundamentals and Application</td>
<td>2</td>
</tr>
<tr>
<td>PHY 200A</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 200B</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 200C</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 210</td>
<td>Computational Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHY 241</td>
<td>Advanced Topics in Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHY 242</td>
<td>Advanced Topics in Superconductivity</td>
<td>3</td>
</tr>
<tr>
<td>SSC 222</td>
<td>Global Carbon Cycle</td>
<td>3</td>
</tr>
</tbody>
</table>

**Policy and Management**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE 147</td>
<td>Resource and Environmental Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CRD 245</td>
<td>Political Economy of Urban and Regional Development</td>
<td>4</td>
</tr>
<tr>
<td>ECI 268</td>
<td>Infrastructure Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECN 125</td>
<td>Efficiency in Energy Markets</td>
<td>4</td>
</tr>
<tr>
<td>ECN 215D</td>
<td>Environment and Economic Development</td>
<td>4</td>
</tr>
<tr>
<td>ESP 163</td>
<td>Energy and Environmental Aspects of Transportation</td>
<td>4</td>
</tr>
<tr>
<td>ESP 212A</td>
<td>Environmental Policy Process</td>
<td>4</td>
</tr>
<tr>
<td>ESP 212B</td>
<td>Environmental Policy Evaluation</td>
<td>4</td>
</tr>
<tr>
<td>ESP 275</td>
<td>Economic Analysis of Resource and Environmental Policy</td>
<td>4</td>
</tr>
<tr>
<td>LAW 235</td>
<td>Administrative Law</td>
<td>3</td>
</tr>
<tr>
<td>LAW 282</td>
<td>Energy Law Seminar</td>
<td>2</td>
</tr>
<tr>
<td>LAW 282AT</td>
<td>Renewable Energy Seminar</td>
<td>2</td>
</tr>
<tr>
<td>LAW 285A</td>
<td>California Environmental Issues</td>
<td>2</td>
</tr>
<tr>
<td>LAW 285E</td>
<td>Climate Change Law and Policy</td>
<td>3</td>
</tr>
<tr>
<td>LDA 201</td>
<td>Theory and Philosophy of the Designed Environment</td>
<td>4</td>
</tr>
<tr>
<td>MGT 206</td>
<td>Decision Making and Management Science</td>
<td>3</td>
</tr>
<tr>
<td>MGT 241</td>
<td>New Product Development</td>
<td>3</td>
</tr>
</tbody>
</table>
c) **Elective Courses (minimum of 17 units)**

M.S. students will develop a coherent course of study with their Major Professor by the end of the student’s first quarter of study. This course of study will be designed so that the student can develop a specialization within the energy field through electives. Students may enroll in any of the courses listed above as eligible for the foundation requirement as electives to fulfill their degree requirements, or the student may enroll in other electives subject to the approval of their Major Professor.

Allowing for this flexibility in the course of study will allow the student and their Major Professor to design tailored courses of study that will result in specializations most relevant to the particular student and his/her career objectives. The following are a few examples of the types of specializations within the field that may be expected from EGG students:

- Building energy efficiency; Biomass conversion; Fuel cell engineering; Sustainable transportation policy; Energy economics; Biofuels; Nanosolar manufacturing; Energy systems analysis; among others.

As a result of the diversity of specializations expected within the EGG program, EGG faculty members have chosen not to pre-identify a list of eligible or preferred electives. As the program matures, however, the Executive Committee of the EGG may consider requiring additional specific courses as certain specializations become more common.

d) **Summary:**

M.S. Plan I students will be required to complete a minimum of 36 units to graduate, at least 18 of which must be at the graduate level in the major field. M.S. Plan II students will be required to complete a minimum of 38 units to graduate, at least 20 of which must be at the graduate level in the major field. All M.S. students will be required to complete 13 units of core coursework, and will be required to complete a minimum of 6 units of additional sub-core coursework to develop a foundation within the student’s chosen degree track (either Energy Science & Technology, or Energy Policy & Management). M.S. students will develop a coherent program of study with their Major Professor by the end of the student’s first quarter of study. This program of study will be designed so that the student can develop a specialization within the energy field through electives.

Full-time students must enroll for 12 units per quarter including research, academic and seminar units. Courses that fulfill any of the program course requirements may not be taken S/U unless the course is normally graded S/U (such as EGG 290 *Energy Seminar*). Once course requirements are completed, students can take additional classes as needed. Per UC regulations students cannot enroll in more than 12 units of graduate level courses (200) or more than 16 units of combined undergraduate and graduate level (100, 200, 300) courses per quarter.

Students must maintain a GPA of 3.0 overall, and a grade of “C” or higher is required in all graduate courses that fulfill the M.S. Degree course requirements. If the GPA falls below the 3.0 minimum, the student is placed on academic probation. If a student is on academic probation for more than two quarters, the student is subject to disqualification upon recommendation by the Graduate Advisor to the Dean of Graduate Studies.
4) **Special requirements:** None.

5) **Committees:**

   a) **Executive Committee:**

   The administration of the EGG program and its activities will be vested in an Executive Committee. The committee will coordinate with the Chair in administering the EGG program and oversee the modification of the EGG program’s mentoring guidelines and application within the program. The committee will consist of the Graduate Advisor, the Graduate Admissions Advisor, and a third member appointed by the Chair. The Graduate Advisor will serve as the Chair of the Executive Committee. The Graduate Staff Coordinator will be a non-voting member of the Executive Committee. Unless otherwise serving as an active member of the Executive Committee, the Director of the UC Davis Energy Institute will serve as an ex-officio member of the Executive Committee.

   The principal responsibilities of the Executive Committee are to:

   1. Administer the graduate program, including the approval of all individual programs of study (POS) and graduate course approval forms;
   2. Nominate Thesis Committee (M.S. Plan I) membership (to include three members, including the Major Professor as Chair, as recommended by the student) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;
   3. Appoint Comprehensive Examination Committees (M.S. Plan II);
   4. Nominate Qualifying Examination Committee (Ph.D.) membership (to include five faculty members and not to be chaired by the student’s Major Professor) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;
   5. Nominate Dissertation Reading Committee (Ph.D.) membership (to include three faculty members and typically Chaired by the student’s Major Professor) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;
   6. In consultation with the Chair of the EGG program, appoint such standing and ad hoc committees as deemed necessary to properly administer the activities of the Program; and
   7. Make decisions regarding financial support of students including decisions concerning the allocation of fellowship funding.

   b) **Thesis Committee (M.S. Plan I)**

   The student, in consultation with the Major Professor and the Graduate Adviser, recommends three faculty members to the Executive Committee to serve on their Thesis Committee. The Major Professor serves as the Chair of the Thesis Committee and must be a faculty member of the Energy Graduate Group. The Executive Committee nominates the Thesis Committee to the Office of Graduate Studies for formal appointment in accordance with Graduate Council Policy. Only members of the Academic Senate or the EGG program have automatic eligibility to serve as members of advanced degree committees.

   Members of the Academic Senate who are *not* members of the EGG program can seek exception to serve as Chair of an advanced degree committee; the petition to do so can be obtained from the Office of Graduate Studies.
Individuals who are not members of the Academic Senate or the EGG program can serve on advanced degree committees with written recommendation from the student and approval by the Graduate Adviser and the Office of Graduate Studies; the petition to do so can be obtained from the Office of Graduate Studies. Nomination of an individual who is neither a member of the Academic Senate nor a member of the EGG program to serve as the Chair of an advanced degree committee is approved by the Executive Committee only in the most exceptional circumstances.

c) **Comprehensive Examination Committee (M.S. Plan II)**

The student, in consultation with the Major Professor and the Graduate Adviser, recommends three faculty members to the Executive Committee to review the capstone project and serve on the Comprehensive Examination Committee. The Major Professor serves as Chair of the Comprehensive Examination Committee and must be a faculty member of the EGG program.

d) **Graduate Affairs Committee**

The Graduate Affairs Committee will be chaired by the Graduate Advisor. The committee will consist of four members, including one graduate student representative, and shall have the following responsibilities:

- (a) To prepare recommendations, as needed, regarding minimum requirements for graduate degrees and other programmatic proposals for consideration by the members of the EGG Program;
- (b) To review and recommend revision to the membership, as needed, of the Energy Graduate Group curriculum;
- (c) To review petitions from graduate students; and
- (d) To assist in the recruitment of graduate students.

Recommended revisions to the EGG Program curriculum must be approved by simple majority vote of the membership.

e) **Student Admissions and Membership Committee**

Once the completed application for admission, all supporting material (as described above), and the application fee have been received, the application will be submitted to the Student Admissions and Membership Committee. The Student Admissions and Membership Committee consists of four faculty members. Based on a review of the entire application, a recommendation is made to accept or decline an applicant’s request for admission. That recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by the Office of Graduate Studies. Applications are accepted through January 1 of the year of anticipated enrollment for priority admission; through March 15 for general admission; and through May 31 if space is still available for the upcoming fall class. Admissions decisions will be announced within approximately 30 to 45 days after the admissions deadline.

6) **Advising Structure and Mentoring:**

The Major Professor is the faculty member who supervises the student’s research and thesis (M.S. Plan I) or comprehensive examination (M.S. Plan II) and helps the student to develop his/her detailed plan of study designed to result in a specialization within the energy field; this person also serves as the Chair of the student’s Thesis or Comprehensive Examination Committee. The Major Professor also advises the student on course selection each quarter. Students are required to submit a proposed Program of Study which lists the quarter’s registration plan (must include at least 12 units per quarter,
and may include research and seminar units). The Major Professor is required to review
and sign off on the proposed Program of Study each quarter. The approved Program of
Study will be filed with the student's official record in the Graduate Program Staff's office.
Any changes to the Program of Study must similarly be approved by the Major Professor.

The Graduate Advisor, who is appointed by the Office of Graduate Studies, is a resource
for information on academic requirements, policies and procedures, and registration
information until the Graduate Affairs Committee of the EGG is formed. The Graduate
Program Coordinator (staff) assists students with identifying a major professor, identifying
appointments and fellowship opportunities, and assists with general university policies.
The Mentoring Guidelines can be found in the graduate student handbook produced by
Graduate Council and can be found online at the following address:

7) Advancement to Candidacy:

Every student must file an official application for Candidacy for the Degree of Master of
Science and pay the Candidacy Fee after completing one-half of their course requirements
and at least one quarter before completing all degree requirements; the student is expected
to complete all degree requirements by the end of the Spring Quarter of the student’s
second year of study. The Candidacy for the Degree of Master of Science form can be
found online at: http://www.gradstudies.ucdavis.edu/forms/. A completed form includes a
list of courses the student will take to complete degree requirements. If changes must be
made to the student’s course plan after s/he has advanced to candidacy, the Graduate
Advisor must recommend these changes to the Office of Graduate Studies. Students must
have their Graduate Advisor and committee Chair sign the candidacy form before it can be
submitted to Graduate Studies. If the candidacy is approved, the Office of Graduate
Studies will send a copy to: the appropriate Graduate Program Coordinator and the
student; the Thesis Committee Chair will also receive a copy, if applicable. If the Office of
Graduate Studies determines that a student is not eligible for advancement, the program
and the student will be told the reasons for the application’s deferral. Some reasons for
deferring an application include: grade point average below 3.0, outstanding “I” grades in
required courses, or insufficient units.

8) Comprehensive Examination and/or Thesis Requirements:

a) Thesis Requirements (M.S. Plan I):

Thesis Committee: M.S. Plan I students, in coordination with their Major Professor, are
expected to form their thesis committee (minimum of three members, including the
Major Professor, who will serve as Chair) by the end of their first quarter of study. The
candidate and Major Professor should meet at least once a year with the other
members of the thesis committee to discuss progress and any changes in research
objectives.

Thesis: Research for the Master's thesis is to be carried out under the supervision of a
faculty member of the program and must represent an original contribution to
knowledge in the field. The thesis research must be conducted while the student is
enrolled in the program. The thesis is submitted to the thesis committee at least one
month before the student plans to make requested revisions. All committee members
must approve the thesis and sign the title page before the thesis is submitted to the
Office of Graduate Studies for final approval. Should the thesis committee determine
that the thesis is unacceptable, even with substantial revision, the thesis committee
may make a recommendation to disqualify the student from the program to the Dean
of Graduate Studies.

The thesis must be filed in a quarter in which the student is registered or on filing fee.
Instructions on preparation of the thesis and a schedule of dates for filing the thesis in
final form are available from the Office of Graduate Studies; the dates are also printed in the UC Davis General Catalog and in the Class Schedule and Registration Guide issued each quarter. A student must have a GPA of 3.0 or higher for the M.S. degree to be awarded.

b) **Comprehensive Examination (M.S. Plan II):**

Fulfillment of the Comprehensive Examination is the last requirement of the M.S. Plan II. A student may take the comprehensive examination once they have advanced to candidacy. However, it is important that the capstone requirement be completed at or near the end of the coursework for the Master’s degree. Consistent with the policy of Graduate Council, most students will sit for the exam at the end of the 5th quarter of study (the end of Winter Quarter in the second year).

The comprehensive examination requirement includes both the submission of a written technical report to the Comprehensive Examination Committee and passing a one-hour oral exam administered by that same committee. The technical report is to be written under the direction of a faculty mentor, who must be a member of the graduate program. The written capstone project report is generally expected to have the scope and quality of a refereed journal paper, without the need to be an original contribution to the field. The student must have the report approved by the Comprehensive Examination Committee; the report constitutes the written portion of the examination.

In addition, an oral presentation and/or oral exam may be required as the discretion of the Chair of the Comprehensive Examination Committee. The format of the presentation and/or oral exam is established by the Chair of the Comprehensive Examination Committee. The scope of the oral exam is the candidate’s coursework as well as the project work. Typically, the three members of the Comprehensive Examination Committee meet with the student for one hour and ask questions related to the report and/or to any courses the student completed to fulfill the M.S. Degree course requirements.

Upon completion of the Comprehensive Examination, the Chair of the Committee must notify the Graduate Coordinator, indicating the following:

- (a) When the student took the Comprehensive Examination;
- (b) The members of the Comprehensive Examination Committee; and,
- (c) The recommendation to pass or not pass.

The Exam committee’s unanimous vote is required to pass a student on the exam. If a student does not pass the exam, the committee may recommend that the student be reexamined a second time, but only if the Graduate Advisor concurs with the committee. The second exam must take place within one quarter of the first exam. The format of the second exam is the same as that of the first exam and may include the submission of an amended version of the report. The examination may not be taken more than twice. A student who does not pass on the second attempt is subject to disqualification from further graduate work in the program.

Once passed, the Master’s Report Form is signed by the Program Graduate Advisor and then forwarded to the Office of Graduate Studies. The deadlines for completing this requirement are listed each quarter in the campus General Catalog (available online at the website of the Office of the Registrar). A candidate must be a registered student or in Filing Fee status at the time the program submits the form, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter. The program must file the report with the Office of Graduate
Studies within one week of the end of the quarter in which the student’s degree will be conferred.

9) **Normative Time to Degree:**

Normative time is the elapsed time (calculated to the near academic quarter) that a student would need to complete all requirements for the degree, assuming that they are engaged in full-time study and making adequate progress. For the Master of Science degree from the Energy Graduate Group, the normative time to advancement to candidacy is 3 quarters and the normative time to advancement to degree is 6 quarters.

10) **Typical Time Line and Sequence of Events:**

The following table provides an example of a study plan for an M.S. Plan I student focused on energy economics and policy. This student has demonstrated fulfillment of the pre-requisite for STA 102, but not for ECN 100. As such, this student addresses this deficiency by taking ECN 100 in the Fall quarter of the first year of study.

For example:

<table>
<thead>
<tr>
<th>Year One</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring (advancement to M.S. candidacy)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EGG 290: Energy Seminar (1)</td>
<td>ARE204A: Microeconomic Analysis I (4)</td>
<td>ECI 268: Infrastructure Economics (3)</td>
</tr>
<tr>
<td></td>
<td>ECN 100: Intro to Microeconomic Theory (4)</td>
<td>EGG 299: Research (4)</td>
<td>LAW 282: Energy Law Seminar (2)</td>
</tr>
<tr>
<td></td>
<td>EGG 299: Research (3)</td>
<td>EGG 299: Research (4)</td>
<td>EGG 299: Research (4)</td>
</tr>
<tr>
<td><strong>Total Units:</strong></td>
<td>8 units (course work)</td>
<td>8 units (course work)</td>
<td>6 units (course work)</td>
</tr>
<tr>
<td></td>
<td>1 unit (seminar)</td>
<td>4 units (research)</td>
<td>2 units (seminar)</td>
</tr>
<tr>
<td></td>
<td>3 units (research):</td>
<td>12 units</td>
<td>4 units (research):</td>
</tr>
<tr>
<td></td>
<td>12 units</td>
<td>12 units</td>
<td>12 units</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year Two</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring (Thesis completed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EGG 290: Energy Seminar (1)</td>
<td>ECN 256: Applied Econometrics (4)</td>
<td>ESP 212B: Environmental Policy Evaluation (4)</td>
</tr>
<tr>
<td></td>
<td>ECN 125: Efficiency in Energy Markets (4)</td>
<td>EGG 299: Research (4)</td>
<td>EGG 299: Research (4)</td>
</tr>
<tr>
<td></td>
<td>EGG 299: Research (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Units:</strong></td>
<td>7 units (course work)</td>
<td>8 units (course work)</td>
<td>8 units (course work)</td>
</tr>
<tr>
<td></td>
<td>1 unit (seminar)</td>
<td>4 units (research)</td>
<td>4 units (research)</td>
</tr>
<tr>
<td></td>
<td>4 units (research):</td>
<td>12 units</td>
<td>12 units</td>
</tr>
</tbody>
</table>

11) **Sources of funding.**

We expect the EGG program to be highly competitive and to attract academically outstanding students to UC Davis. Through the combination of existing campus financial commitments and significant extramural fundraising, it is expected that all EGG students will receive fellowships.
and/or research appointments.

The following summarizes the sources of expected support for EGG students:

- **Campus financial commitments**: Significant fellowship support committed by the Deans of Engineering, Graduate Studies, and Agricultural and Environmental Sciences.

- **Corporate support**: The Energy Institute will pursue corporate sponsorships of energy related research to support EGG students, beyond those already available through other energy-related centers in the Energy Hub.

- **Existing fellowship opportunities**: EGG students studying transportation-related energy issues will be eligible to compete for substantial existing fellowship opportunities.

- **Faculty grants**: Some EGG students may be funded on existing faculty research grants.

- **Extramural research funding**: The Energy Institute will aggressively pursue interdisciplinary energy research grants from federal and state agencies, and foundations.

**Campus Commitments.** Many incoming students will be eligible for external and campus fellowships including those funded by the commitments described in letters from the Deans of Engineering, Graduate Studies, and Agricultural and Environmental Sciences found in Appendix A. Fellowship funding committed by those deans totals $350,000 over the first three years of the EGG program, after which time the Office of Graduate Studies will support the program through the Graduate Program Fellowship Allocation (with funding of $240,000 per year on the basis of expected EGG enrollment beginning in Year 4).

**Corporate Support.** Additional fellowship support for EGG students is expected to be raised from extramural sources by the Energy Institute. One strategy will be for the Energy Institute to adopt the successful modeled developed by the Institute of Transportation Studies (ITS-Davis) that provides fellowship support through its Corporate Affiliate Program for students studying transportation issues. Through that program, affiliate members of ITS-Davis make major gifts to support core programs; current members are BMW, BP, ExxonMobil, Daimler, Nissan, Shell, Toyota, and PG&E. The Energy Institute will be able to leverage these corporate connections as it works with affiliated research centers in the Energy Hub to raise new funding sources for EGG student fellowships.

**Existing Fellowship Opportunities.** Moreover, to the extent that any EGG students have research interests in transportation-related energy issues, they may also be eligible to apply for existing fellowships offered by ITS-Davis or by affiliated research centers, such as the National Center for Sustainable Transportation (NCST). NCST is co-located with the Energy Institute at the Energy Hub at West Village and is funded by the U.S. Department of Transportation (with match funding from the California Air Resources Board, California Department of Transportation, and California Energy Commission) at a minimum of $11.2 million over four years (roughly half of which is dedicated to UC Davis).

**Faculty Grants.** Some EGG students will also likely be funded through existing faculty research grants focused on energy topics. In some instances, this may be to the exclusion of existing students in other departments on campus, but in others, faculty will likely be able to fund additional students due to the increased capabilities that EGG student researchers will provide. For more details about the extent to which faculty envision including EGG students on existing research grants, see the letters of support from EGG faculty in Appendix B.

**Extramural Research Funding.** The final source of expected funding for EGG students will come from research grants to fund interdisciplinary energy research. The Energy Institute will aggressively identify and pursue targets external sources of research funding, such as research grants from federal and state agencies or from foundations. The sub-section below provides an overview of the federal and state energy research trends.

Funding decisions related to fellowships are generally made by either the Graduate Program
Committee or Graduate Studies, depending on the source of funding for the fellowship. Not all fellowship funding decisions are made by either the Graduate Program Committee or Graduate Studies; as examples, graduate students may also seek fellowship funding directly from the US Environmental Protection Agency, National Science Foundation, US Department of Energy, foundations, and a range of other agencies and organizations. Funding decisions related to Research Assistantships are made by the Principal Investigator of the source of funding.

12) PELP, In Absentia and Filing Fee status.

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

1) Admissions Requirements:
Admissions decisions will be made on a case-by-case basis according to the following timeline:

- **Priority Deadline:** January 1 (priority given for fellowships)
- **General Deadline:** March 15
- **Final Deadline:** May 31 (space permitting)

Applicants will be notified of admissions decisions within approximately 30 to 45 days after the application deadline. Meeting some or all of the admissions criteria outlined below does not guarantee admission, but merely confirms eligibility. The decision to recommend admission to the Dean of Graduate Studies will be made by the Student Admissions and Membership Committee of the Energy Graduate Group on the basis of available space and the competitiveness of applicants.

All applicants must complete the current “UC Davis Graduate Application” available online through the UC Davis Office of Graduate Studies and submit the required application fee. That online application will require applicants to provide:

- **Basic Information**
- **Personal Information**
- **Plans for Graduate Study**
- **U.S. Citizens and Permanent Residents**
- **Academic History**
- **Other Information**
- **Test Scores**
- **Statement of Purpose / Personal History Statement**
- **Data Verification**
- **Recommendations**

In addition to completing the “UC Davis Graduate Application” online, the following criteria are required for admission to the Energy Graduate Group:

- **Undergraduate Degree.** Consideration for program admission requires a bachelor’s degree from an accredited institution. Strong applicants to the program who intend to pursue a degree in Energy Science & Technology will likely have received an undergraduate degree in engineering, mathematics, the physical sciences, or a related field. Strong applicants to the program who intend to pursue a degree in Energy Policy & Management will likely have received an undergraduate degree in economics, political science, policy, planning, management, or a related field.

- **Minimum GPA.** A minimum GPA of 3.0 in the applicant’s undergraduate program and in any prior graduate program is required.

- **Letters of Recommendation.** Applicants will be required to submit three letters of recommendation through the online “UC Davis Graduate Application.” Applicants are encouraged to submit professional letters of recommendation, but at least one letter should be from a professor who can assess your potential for advanced academic work.

- **Official Transcripts.** Applicants will be required to submit official transcripts from any previous institution of higher education attended. This requirement is in addition to reporting degrees awarded and GPA attained on the online “UC Davis Graduate Application.”
Resume (optional). Applicants are encouraged to submit a current resume that reflects work experience, academic track record, and any other relevant information.

Statement of Purpose. All applicants are required to complete the Statement of Purpose required on the online “UC Davis Graduate Application.”

Personal History Statement. All applicants are required to complete the Personal History Statement required on the online “UC Davis Graduate Application.”

GRE Scores. Applicants will be required to submit official GRE General Test scores from within the last 5 years. This requirement is in addition to self-reporting GRE test scores on the online “UC Davis Graduate Application.” Competitive applicants will report strong overall GRE scores. For the Energy Science & Technology degree track, most successful applicants will have a very strong GRE Quantitative Reasoning score. For the Energy Policy & Management degree track, most successful applicants will have a very strong GRE Verbal Reasoning score.

Application and Fee. All applicants will be required to complete the Office of Graduate Studies online “UC Davis Graduate Application” application and to remit the accompanying application fee by the stated admission deadline.

Research Interests. Applicants are required to list three areas of potential research interest within the energy field. Please use only one to five words to describe each interest.

Faculty Mentor. Applicants are required to list three potential faculty mentors identified by the applicant on the basis of his/her research interests. Applicants are strongly encouraged to communicate with potential research advisors (Major Professors) prior to admission to the Energy Graduate Group. Ideally, this process of communicating with potential Major Professors should begin no later than in the Fall prior to anticipated enrollment. Applicants should take the initiative to inquire about future research directions of specific faculty at UC Davis, exchange research ideas with potential Major Professors, and make an effort to identify viable possibilities. To assist applicants, the UC Davis Energy Institute will maintain a website that identifies faculty affiliated with the Energy Graduate Group and notes their area(s) of expertise.

TOEFL/IELTS Requirements. The program will follow the policies of the UC Davis Graduate Council for evaluation of international applicants. TOEFL or IELTS scores must be submitted to demonstrate English language proficiency for international applicants who have not studied at an institution where the language of instruction was in English. International applicants must meet the Office of Graduate Studies minimum score requirement.

a) Prerequisites:

In addition to the admission requirements stated above, applicants are expected to have passed the equivalent of the following UC Davis courses:

All EGG students, regardless of track, must have completed at least one of the following courses in upper division Statistics (or its equivalent) and must have completed the following two courses in Calculus (or its equivalent):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 102</td>
<td>Introduction to Probability Modeling and Inference</td>
<td>4</td>
</tr>
<tr>
<td>STA 103</td>
<td>Applied Statistics for Business and Economics</td>
<td>4</td>
</tr>
<tr>
<td>STA 104</td>
<td>Applied Statistical Methods: Nonparametric Stats</td>
<td>4</td>
</tr>
<tr>
<td>STA 106</td>
<td>Applied Statistical Methods: Analysis of Variance</td>
<td>4</td>
</tr>
<tr>
<td>STA 108</td>
<td>Applied Statistical Methods: Regression Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MAT 21A</td>
<td>Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MAT 21B</td>
<td>Calculus</td>
<td>4</td>
</tr>
</tbody>
</table>
For the Energy Science & Technology track, applicants must have an undergraduate or graduate degree in Engineering from an accredited institution, or have completed at least two of the following courses (or their equivalent):

- CHE 110A Physical Chemistry: Introduction 4 units
- CHE 124A Inorganic Chemistry: Fundamentals 4 units
- CHE 128A Organic Chemistry 4 units
- PHY 110A Electricity and Magnetism 4 units
- PHY 140A Introduction to Solid State Physics 4 units

For the Energy Policy & Management track, applicants must have completed the following course (or its equivalent):

- ECN 100 Intermediate Microeconomic Theory 4 units

b) Deficiencies:
Pre-requisite coursework deficiencies must be taken for a letter-grade and are expected to be completed by the time the student files for advancement to candidacy.

2) Dissertation Plan:
The Energy Graduate Group will offer the Ph.D. Plan B. This plan is described in detail under Section 519(D)(2) of the Davis Division Academic Senate Regulations, and described in greater detail in Section 8 below.

Pursuant to those rules, and consistent with the bylaws of the Energy Graduate Group, the student will nominate to the Executive Committee of the EGG a Dissertation Committee consisting of at least three faculty members, with the candidate’s Major Professor serving as Chair. The Executive Committee will formally recommend the Dissertation Committee to Graduate Council for final appointment.

Formal requirements for the degree of Ph.D. will include passing an oral Qualifying Examination (QE), completion of an acceptable dissertation, and a final oral presentation to serve as an exit seminar. These steps are described in greater detail in Section 8 below. In the QE, the student will be examined by a committee of faculty on the major (either the Energy Science & Technology track or Energy Policy & Management track) and any minor fields of study as identified in the student’s approved Program of Study. The QE will be used to determine the adequacy of the student’s preparation to undertake the dissertation research prior to advancement to candidacy for the degree. The exit seminar will be open to the public and will be attended by the student’s faculty dissertation review committee members to provide the student recommendations for any necessary thesis revisions prior to approval.

The Energy Graduate Group will not offer the C.Phil. degree for students who are advanced to candidacy for the Ph.D. but have not yet received that degree.

3) Course Requirements – Core, Sub-Core, and Electives (minimum of 45 units)
Ph.D. students will be required to take at least 45 units, of which 30 units must be graduate level courses in the major, exclusive of seminars and research units, and an additional 15 units of upper division or graduate courses. All required courses must be completed before taking the qualifying examination. At least 24 of these required units must be taken at UC Davis. In-depth knowledge in the major field can typically be obtained by completing approximately 30 units in upper division and graduate courses.

Ph.D. students will be required to complete four Core Courses, and will be required to enroll in EGG 290 Energy Seminar in the Fall Quarter of their first, second, and third years of the program. Ph.D. students will also be required to take at least one course in research design. Additionally, Ph.D. students will be required to take an additional two courses (minimum of 6 units) from among a list of pre-approved Sub-Core Courses designed to give the student a
strong foundation in their chosen degree track (either Energy Science & Technology, or Energy Policy & Management).

The remaining units required for the student to achieve the minimum of 45 units required for the degree will be determined by a program of study developed by the student in coordination with their Major Professor that is designed to provide the student with a specialization within the energy field. Ph.D. students will also be expected to take EGG 299 research units each quarter as they work toward completing their dissertation.

a) **Core Courses (13 units)**

- EGG 200 Introduction to Energy Science and Technology 4 units
- EGG 201 Life-Cycle Analysis of Energy Systems 4 units
- EGG 202 Energy and Climate Policy 3 units
- EGG 290 Energy Seminar 1 unit (x3)

b) **Research Design Requirement (minimum of 3 units)**

In addition to the core courses outlined above, students in the Ph.D. program will also be required to take at least one course (minimum of 3 units) in research design. The courses that fulfill this requirement depend on whether the student is pursuing the Ph.D. in Energy Science & Technology, or in Energy Policy & Management.

The following courses satisfy this requirement for Ph.D. candidates on the Energy Science & Technology track:

- STA 205 Statistical Methods for Research with SAS 4 units
- STA 233 Design of Experiments 3 units
- EBS 265 Design and Analysis of Engineering Experiments 5 units

The following courses satisfy this requirement for Ph.D. candidates on the Energy Policy & Management track:

- STA 205 Statistical Methods for Research with SAS 4 units
- PSC 207 Survey and Questionnaire Research Methods 4 units

c) **Sub-Core Foundation Courses (6 to 8 units)**

In addition to the “Core Requirements” above, all students will be required to take at least two courses (minimum 6 units) in a foundation area. At least one course (minimum 3 units) taken to fulfill the Sub-Core foundation requirement must be taken at the graduate level, while the other may be upper division. Students in the Energy Science & Technology track will be required to take courses in either (a) Engineering and Technology or (b) Energy Sciences to fulfill this requirement. Students in the Energy Policy & Management track will be required to take courses in Policy & Management to fulfill this requirement.

**Engineering and Technology**

- DES 136A Lighting Technology and Design 4 units
- EBS 218 Solar Thermal Engineering 4 units
- EBS 265 Design and Analysis of Engineering Experiments 5 units
- ECE 216 Low Power Digital Integrated Circuit Design 3 units
- ECE 284 Design and Optimization of Embedded Computing Sys. 4 units
- ECI 125 Building Energy Performance 4 units
- ECI 143 Green Engineering Design and Sustainability 4 units
- ECI 268 Infrastructure Economics 3 units
- EME 106 Thermo-Fluid Dynamics 4 units
- EME 163 Internal Combustion Engines and Future Alternatives 4 units
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS 170</td>
<td>Sustainable Energy Technology: Batteries, Fuel Cell, PV</td>
<td>4</td>
</tr>
<tr>
<td>ENG 160</td>
<td>Environmental Physics and Society</td>
<td>3</td>
</tr>
<tr>
<td>MAE 216</td>
<td>Advanced Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>MAE 217</td>
<td>Combustion</td>
<td>4</td>
</tr>
<tr>
<td>MAE 218</td>
<td>Advanced Energy Systems</td>
<td>4</td>
</tr>
<tr>
<td>MAE 258</td>
<td>Hybrid Electric Vehicle System Theory and Design</td>
<td>4</td>
</tr>
<tr>
<td>MAE 268</td>
<td>Wind Power Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MAE 269</td>
<td>Fuel Cell Systems</td>
<td>4</td>
</tr>
<tr>
<td>MAE 271</td>
<td>Advanced Modeling and Simulation of Mechatronic Sys.</td>
<td>4</td>
</tr>
<tr>
<td>MAE 272</td>
<td>Theory and Design of Control Systems</td>
<td>4</td>
</tr>
<tr>
<td><strong>Energy Sciences</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATM 116</td>
<td>Climate Change</td>
<td>4</td>
</tr>
<tr>
<td>ATM 149</td>
<td>Air Pollution (same as ECI 149)</td>
<td>4</td>
</tr>
<tr>
<td>CHE 205</td>
<td>Symmetry, Spectroscopy, and Structure</td>
<td>3</td>
</tr>
<tr>
<td>CHE 226</td>
<td>Principles of Transition Metal Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 228C</td>
<td>Solid-State Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 228D</td>
<td>Homogenous Catalysis</td>
<td>3</td>
</tr>
<tr>
<td>CHE 241D</td>
<td>Electroanalytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>EBS 267</td>
<td>Renewable Bioprocessing</td>
<td>3</td>
</tr>
<tr>
<td>EBS 270</td>
<td>Modeling and Analysis of Biological and Physical Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECI 241</td>
<td>Environmental Reactive Chemical Transport Modeling</td>
<td>4</td>
</tr>
<tr>
<td>ETX 203</td>
<td>Environmental Toxicants</td>
<td>4</td>
</tr>
<tr>
<td>FST 205</td>
<td>Industrial Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 214</td>
<td>Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 263</td>
<td>Biotechnology Fundamentals and Application</td>
<td>2</td>
</tr>
<tr>
<td>PHY 200A</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 200B</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 200C</td>
<td>Theory of Mechanics and Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 210</td>
<td>Computational Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHY 241</td>
<td>Advanced Topics in Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHY 242</td>
<td>Advanced Topics in Superconductivity</td>
<td>3</td>
</tr>
<tr>
<td>SSC 222</td>
<td>Global Carbon Cycle</td>
<td>3</td>
</tr>
<tr>
<td><strong>Policy and Management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARE 147</td>
<td>Resource and Environmental Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CRD 245</td>
<td>Political Economy of Urban and Regional Development</td>
<td>4</td>
</tr>
<tr>
<td>ECI 268</td>
<td>Infrastructure Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECN 125</td>
<td>Efficiency in Energy Markets</td>
<td>4</td>
</tr>
<tr>
<td>ECN 215D</td>
<td>Environment and Economic Development</td>
<td>4</td>
</tr>
<tr>
<td>ESP 163</td>
<td>Energy and Environmental Aspects of Transportation</td>
<td>4</td>
</tr>
<tr>
<td>ESP 212A</td>
<td>Environmental Policy Process</td>
<td>4</td>
</tr>
<tr>
<td>ESP 212B</td>
<td>Environmental Policy Evaluation</td>
<td>4</td>
</tr>
<tr>
<td>ESP 275</td>
<td>Economic Analysis of Resource and Environmental Policy</td>
<td>4</td>
</tr>
<tr>
<td>LAW 235</td>
<td>Administrative Law</td>
<td>3</td>
</tr>
<tr>
<td>LAW 282</td>
<td>Energy Law Seminar</td>
<td>2</td>
</tr>
</tbody>
</table>
d) **Elective Courses (minimum of 23 units)**
Ph.D. students will develop a coherent program of study with their Major Professor by the end of the student’s first quarter of study. This program of study will be designed so that the student can develop a specialization within the energy field through electives. Students may enroll in any of the courses listed above as eligible for the foundation requirement as electives to fulfill their degree requirements, or the student may enroll in other electives subject to the approval of their Major Professor.

Allowing for this flexibility in the course of study will allow the student and their Major Professor to design tailored programs of study that will result in specializations most relevant to the particular student and his/her career objectives. The following are a few examples of the types of specializations within the field that may be expected from EGG students:

- Building energy efficiency; Biomass conversion; Fuel cell engineering; Sustainable transportation policy; Energy economics; Biofuels; Nanosolar manufacturing; Energy systems analysis; among others.

As a result of the diversity of specializations expected within the EGG program, EGG faculty members have chosen not to pre-identify a list of eligible or preferred electives. As the program matures, however, the Executive Committee of the EGG may consider requiring additional specific courses as certain specializations become more common.

e) **Summary:**
Ph.D. students will be required to complete a minimum of 45 units to graduate, at least 30 of which must be at the graduate level in the major field. Of those units, all Ph.D. students will be required to complete 13 units of core coursework, and will be required to complete a minimum of 6 units of additional sub-core coursework to develop a foundation within the student’s chosen degree track (either Energy Science & Technology, or Energy Policy & Management). Ph.D. students will also be required to take at least one course in research design. Ph.D. students will then develop a coherent program of study with their Major Professor by the end of the student’s first quarter of study. This program of study will be designed so that the student can develop a specialization within the energy field through electives.

Full-time students must enroll for 12 units per quarter including research, academic and seminar units. Courses that fulfill any of the program course requirements may not be taken S/U unless the course is normally graded S/U (such as EGG 290 *Energy Seminar*). Once course requirements are completed, students can take additional classes as needed. Per UC regulations students cannot enroll in more than 12 units of graduate level courses (200) or more than 16 units of combined undergraduate and graduate level (100, 200, 300) courses per quarter.
Students must maintain a GPA of 3.0 overall, and a grade of “C” or higher is required in all graduate courses that fulfill the M.S. Degree course requirements. If the GPA falls below the 3.0 minimum, the student is placed on academic probation. If a student is on academic probation for more than two quarters, the student is subject to disqualification upon recommendation by the Graduate Advisor to the Dean of Graduate Studies.

4) Special Requirements: After passing the Qualifying Examination, all Ph.D. students are expected to give a seminar presentation on their dissertation progress at least once annually.

5) Committees:
   a) Executive Committee:

   The administration of the EGG program and its activities will be vested in an Executive Committee. The committee will coordinate with the Chair in administering the EGG program and oversee the modification of the EGG program’s mentoring guidelines and application within the program. The committee will consist of the Graduate Advisor, the Graduate Admissions Advisor, and a third member appointed by the Chair. The Graduate Advisor will serve as the Chair of the Executive Committee. The Graduate Staff Coordinator will be a non-voting member of the Executive Committee. Unless otherwise serving as an active member of the Executive Committee, the Director of the UC Davis Energy Institute will serve as an ex-officio member of the Executive Committee.

   The principal responsibilities of the Executive Committee are to:

   (1) Administer the graduate program, including the approval of all individual programs of study (POS) and graduate course approval forms;

   (2) Nominate Thesis Committee (M.S. Plan I) membership (to include three members, including the Major Professor as Chair, as recommended by the student) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;

   (3) Appoint Comprehensive Examination Committees (M.S. Plan II);

   (4) Nominate Qualifying Examination Committee (Ph.D.) membership (to include five faculty members and not to be chaired by the student’s Major Professor) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;

   (5) Nominate Dissertation Reading Committee (Ph.D.) membership (to include three faculty members and typically Chaired by the student’s Major Professor) to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy;

   (6) In consultation with the Chair of the EGG program, appoint such standing and ad hoc committees as deemed necessary to properly administer the activities of the Program; and

   (7) Make decisions regarding financial support of students including decisions concerning the allocation of fellowship funding.

   b) Qualifying Examination Committee (Ph.D.)

   The student, in consultation with the Major Professor and the Graduate Adviser, recommends five faculty members to the Executive Committee to serve on their Qualifying Examination (QE) Committee. The QE Committee conducts the exam and submits the results to the Office of Graduate Studies. The Major Professor is not to
serve as the Chair of the QE Committee. The Executive Committee nominates the QE Committee to the Office of Graduate Studies for formal appointment in accordance with Graduate Council Policy. Only members of the Academic Senate or the EGG program have automatic eligibility to serve as members of advanced degree committees.

Members of the Academic Senate who are not members of the EGG program can seek exception to serve as Chair of an advanced degree committee; the petition to do so can be obtained from the Office of Graduate Studies.

Individual who are not members of the Academic Senate or the EGG program can serve on advanced degree committees with written recommendation from the student and approval by the Graduate Adviser and the Office of Graduate Studies; the petition to do so can be obtained from the Office of Graduate Studies. Nomination of an individual who is neither a member of the Academic Senate nor a member of the EGG program to serve as the Chair of an advanced degree committee is approved by the Executive Committee only in the most exceptional circumstances.

c) **Dissertation Reading Committee (Ph.D.)**

The Dissertation Committee is a three-member committee identified by the student, in consultation with the Major Professor. The majority of the committee should be from faculty members of the EGG program. The composition of the dissertation committee is entered on the Advancement to Candidacy Form and submitted by the group’s Executive Committee to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy.

The role of the Dissertation Committee is to advise the doctoral student on the research topic and methods, and then to review the final completed dissertation for acceptance. The Committee Chair (usually the Major Professor) should determine the desires of the individual members regarding assistance with the research and dissertation review at the time the dissertation committee is constituted. Students are expected to meet with the Chair of their dissertation committee regularly. Dissertation committee members are expected to read and comment on a dissertation within four weeks from its submission. This time limit policy does not apply to summer periods for faculty holding nine-month appointments. The student and faculty will coordinate a timeline for the student to present the thesis to the dissertation committee. This timeline must allow all dissertation committee members enough time to fulfill their responsibilities within the four-week deadline.

d) **Graduate Affairs Committee**

The Graduate Affairs Committee will be chaired by the Graduate Advisor. The committee will consist of four members, including one graduate student representative, and shall have the following responsibilities:

(e) To prepare recommendations, as needed, regarding minimum requirements for graduate degrees and other programmatic proposals for consideration by the members of the EGG Program;

(f) To review and recommend revision to the membership, as needed, of the Energy Graduate Group curriculum;

(g) To review petitions from graduate students; and

(h) To assist in the recruitment of graduate students.

Recommended revisions to the EGG Program curriculum must be approved by simple majority vote of the membership.

e) **Student Admissions and Membership Committee**
Once the completed application for admission, all supporting material (as described above), and the application fee have been received, the application will be submitted to the Student Admissions and Membership Committee. The Student Admissions and Membership Committee consists of four faculty members. Based on a review of the entire application, a recommendation is made to accept or decline an applicant’s request for admission. That recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by the Office of Graduate Studies. Applications are accepted through January 1 of the year of anticipated enrollment for priority admission; through March 15 for general admission; and through May 31 if space is still available for the upcoming fall class. Admissions decisions will be announced within approximately 30 to 45 days after the admissions deadline.

6) Advising Structure and Mentoring:

The Major Professor is the faculty member who supervises the student’s research and dissertation and helps the student to develop his/her detailed program of study designed to result in a specialization within the energy field; this person also serves as the Chair of the student’s Dissertation Reading Committee. The Major Professor is not, however, permitted to Chair the Qualifying Examination Committee. The Major Professor also advises the student on course selection each quarter. Students are required to submit a proposed program of study which lists the quarter’s registration plan (must include at least 12 units per quarter, and may include research and seminar units). The Major Professor is required to review and sign off on the proposed program of study each quarter. The approved program of study will be filed with the student’s official record in the Graduate Program Staff’s office. Any changes to the program of study must similarly be approved by the Major Professor.

The Graduate Advisor, who is appointed by the Office of Graduate Studies, is a resource for information on academic requirements, policies and procedures, and registration information until the Graduate Affairs Committee of the EGG is formed. The Graduate Program Coordinator (staff) assists students with identifying a Major Professor, identifying appointments and fellowship opportunities, and assists with general university policies. The Mentoring Guidelines can be found in the graduate student handbook produced by Graduate Council and can be found online at the following address: http://gradstudies.ucdavis.edu/sites/default/files/upload/files/grad-council/mentoring.pdf

7) Advancement to Candidacy:

Before advancing to candidacy for a doctoral degree, a student must have satisfied all requirements set by the graduate program, must have maintained a minimum GPA of 3.0 in all course work undertaken (except those courses graded S or U), and must have passed a Qualifying Examination before a committee appointed to administer that examination in accordance with Graduate Council policy. Normally, students advance by the end of the 9th quarter of study. The student must file the appropriate paperwork with the Office of Graduate Studies and pay the Candidacy Fee in order to be officially promoted to Ph.D. Candidacy. Refer to the Graduate Council website for additional details regarding the Doctoral Qualifying Examination at http://gradstudies.ucdavis.edu/gradcouncil/policiesall.html.

8) Preliminary Examination, Qualifying Examination and Dissertation requirements:

a) Preliminary Examination

The Ph.D. program does not have a preliminary examination.

b) Qualifying Examination

1. General Information
All students will complete all course requirements before taking their Qualifying Examination (QE). Passing the QE exam makes the student eligible for advancement to candidacy. The QE should be taken by no later than the end of the 9th quarter after admission to the Ph.D. program. According to university policy, graduate students cannot hold an academic title (e.g., GSR, TA) for more than nine quarters before passing their QE.

The primary purpose of the QE is to validate that the student is academically qualified to conceptualize a research topic, undertake scholarly research and successfully produce the dissertation required for a doctoral degree. The QE must evaluate the student’s command of the field, ensuring that the student has both breadth and depth of knowledge, and must not focus solely on the proposed dissertation research. In addition, the QE provides an opportunity for the committee to provide important guidance to the student regarding his or her chosen research topic.

The QE will consist of both written and oral examinations.

2. Written Portion of the Qualifying Exam – Dissertation Prospectus

At a minimum the written portion of the QE consists of a research proposal called the Dissertation Prospectus. The Prospectus should be provided to members of the QE committee at least 10 days before the oral portion of the QE.

The Prospectus is an independently prepared proposal of 5-10 pages describing the student's dissertation-specific research aims, hypotheses, progress to date, and experimental approach. Concepts within the research proposal can be discussed with others (such as the student's Major Professor and peers), but the writing of the proposal should be solely the student's work (i.e., no editorial assistance is allowed) as the proposal will serve as evidence of the student's proficiency in scientific writing.

The QE committee will be responsible for assessing that the student's writing proficiency is satisfactory before advancement to candidacy. Furthermore, the Prospectus will provide information that may be discussed during the oral portion of the QE.

3. Oral Portion of the Qualifying Exam

The oral portion of the QE will be 2-3 hours in length and is intended to demonstrate the student's critical thinking ability, powers of imagination and synthesis, and broad knowledge of the field of study.

The QE committee will evaluate the student's general qualifications for a respected position as an educator or leader as well as the student's preparation in a special area of study based upon relevant portions of the student's previous academic record, performance on specific parts of the examination, and the student's potential for scholarly research as indicated during the examination.

4. Outcome of the Qualifying Exam

The QE committee will reach a decision on the student’s performance immediately after the oral portion of the QE exam. The QE committee, having reached a unanimous decision, shall inform the student of its decision to:

- “Pass” (no conditions may be appended to this decision),
- “Not Pass” (the Chair’s report should specify whether the student is required to retake all or part of the examination, list any additional
requirements, and state the exact timeline for completion of requirements to achieve a "Pass"), or

- “Fail.”

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

Note that to address any deficiencies identified during the oral portion of the QE exam, additional work, as determined by the QE committee, may be required of the student in order to pass the QE on second attempt.

c) The Dissertation

1. Exit Seminar

The dissertation follows Plan B with a required exit seminar. Satisfaction of this requirement must be verified by the Dissertation Committee Chair. The Exit Seminar is a formal public presentation of the student’s research before the program faculty and students. It is recommended that this presentation take place during the final quarter of the program. The Dissertation Committee will not sign the Dissertation until after the exit seminar has taken place. Adequate scheduling of the exit seminar is the responsibility of the student.

2. Dissertation: General Requirements

Filing of a Ph.D. dissertation with the Office of Graduate Studies is normally the last requirement satisfied by the candidate. The deadlines for completing this requirement are listed each quarter in the campus General Catalog (available online at the website of the Office of the Registrar or from the Bookstore) and are available from the Office of Graduate Studies. A candidate must be a registered student or in Filing Fee status at the time of filing a dissertation, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter. The PhD. Dissertation will be prepared, submitted, and filed according to regulations instituted by the Office of Graduate Studies http://gradstudies.ucdavis.edu/students/filing.html Satisfaction of this requirement must be verified by the Dissertation Committee Chair.

3. Dissertation:

The research conducted by the student must be of such character as to show ability to pursue independent research. The dissertation reports a scholarly piece of work of publishable quality that solves a significant scientific problem in the field and is carried out under the supervision of a member of program while the student is enrolled in the program. The chair of the Dissertation Committee must be a member of the EGG program and must be immediately involved with the planning and execution of the experimental work done to formulate the dissertation. The Major Professor’s laboratory is the setting for most of the student’s research activities, unless an alternative site and immediate supervisor are approved in advance by the Executive Committee.

Students should meet regularly with their Dissertation Committee. The dissertation must be submitted to each member of the dissertation committee at least one month before the student expects to make requested revisions; committee
members are expected to respond within 4 weeks, not including summer months for nine month faculty. Informing committee members of progress as writing proceeds helps the members to plan to read the dissertation and provide feedback within this time frame. The dissertation must be approved and signed by the dissertation committee before it is submitted to the Office of Graduate Studies for final approval.

9) Normative Time to Degree

Normative time is the elapsed time (calculated to the near academic quarter) that a student would need to complete all requirements for the degree, assuming that they are engaged in full-time study and making adequate progress. For the Ph.D. degree from the Energy Graduate Group, the normative time to advancement to candidacy is 9 quarters (three years of full-time academic enrollment).

For Ph.D. students, measured from the time a student begins graduate study, the normative time in candidacy to complete the dissertation and earn the degree is approximately 5 years. For a student entering the Ph.D. program already having an M.S. degree in the field, the normative time in candidacy to complete the dissertation and earn the Ph.D. degree is approximately 3 years.

10) Typical Time Line and Sequence of Events

This section provides two timelines. The first table illustrates the expected timeline for full-time Ph.D. to meet broad objectives within the program. The second table presents an example of a study plan for a Ph.D. student focused on energy engineering.

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Expected Quarter of Completion After Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a Major Professor</td>
<td>1</td>
</tr>
<tr>
<td>Submit Graduate Student Study List</td>
<td>1 / 2 / 3</td>
</tr>
<tr>
<td>Select Program of Study Committee</td>
<td>1</td>
</tr>
<tr>
<td>Submit Graduate Student Annual Progress Report</td>
<td>3 / 6 / 9 / 12 / 15</td>
</tr>
<tr>
<td>Submit Preliminary Program of Study</td>
<td>2</td>
</tr>
<tr>
<td>Establish Dissertation Committee</td>
<td>3</td>
</tr>
<tr>
<td>Submit final Program of Study</td>
<td>6</td>
</tr>
<tr>
<td>Submit Application for Qualifying Exam</td>
<td>6</td>
</tr>
<tr>
<td>Take initial Qualifying Exam</td>
<td>6</td>
</tr>
<tr>
<td>Retake Qualifying Exam (if necessary)</td>
<td>9</td>
</tr>
<tr>
<td>Submit Application for Advancement to Candidacy</td>
<td>6 / 9</td>
</tr>
<tr>
<td>File Dissertation and Present Exit Seminar</td>
<td>15</td>
</tr>
</tbody>
</table>

The following table presents an example of a study plan for a Ph.D. student focused on energy engineering and economic modeling of energy systems. This student will have entered the EGG program with an undergraduate degree in Engineering and thus has fulfilled all pre-requisites.

<table>
<thead>
<tr>
<th>Year One</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>EGG 200</strong>: Fundamentals of Energy Science and Technology (4)</td>
<td><strong>EGG 201</strong>: Life Cycle Analysis in Energy Systems (4)</td>
<td><strong>EGG 202</strong>: Energy and Climate Policy (3)</td>
</tr>
<tr>
<td>Year</td>
<td>Fall</td>
<td>Winter</td>
<td>Spring</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Two</td>
<td><strong>EGG 290</strong>: Energy Seminar (1)</td>
<td><strong>MAE 271</strong>: Advanced Modeling and Simulation of Mechatronic Systems (4)</td>
<td><strong>ECI 268</strong>: Infrastructure Economics (4)</td>
</tr>
<tr>
<td></td>
<td><strong>MAE 216</strong>: Advanced Thermodynamics (4)</td>
<td><strong>ECI 125</strong>: Building Energy Performance (4)</td>
<td><strong>MAE 272</strong>: Theory and Design of Control Systems (4)</td>
</tr>
<tr>
<td></td>
<td><strong>MAE 218</strong>: Advanced Energy Systems (4)</td>
<td><strong>EGG 299</strong>: Research (4)</td>
<td><strong>EGG 299</strong>: Research (4)</td>
</tr>
<tr>
<td></td>
<td><strong>EGG 299</strong>: Research (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Units:</td>
<td>8 units (course work) 1 unit (seminar) 3 units (research):</td>
<td>8 units (course work) 4 units (research)</td>
<td>8 units (course work) 4 units (research)</td>
</tr>
<tr>
<td></td>
<td>12 units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three</td>
<td><strong>EGG 290</strong>: Energy Seminar (1)</td>
<td><strong>ARE 256B</strong>: Applied Econometrics II (4)</td>
<td><strong>ECI 249</strong>: Probability Design and Optimization (4)</td>
</tr>
<tr>
<td></td>
<td><strong>ARE 256A</strong>: Applied Econometrics I (4)</td>
<td><strong>EGG 299</strong>: Research (8)</td>
<td><strong>EGG 299</strong>: Research (8)</td>
</tr>
<tr>
<td></td>
<td><strong>ECI 250</strong>: Civil Infrastructure System Optimization and Identification (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>EGG 299</strong>: Research (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Units:</td>
<td>8 units (course work) 1 unit (seminar) 3 units (research):</td>
<td>4 units (course work) 8 units (research)</td>
<td>4 units (course work) 8 units (research)</td>
</tr>
<tr>
<td></td>
<td>12 units</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The student will take predominantly EGG 299 research units in years four and five of study as the student completes the research needed for the dissertation. The student may take additional graduate or upper-division courses during this time as determined to be appropriate by the Major Professor.

11) Sources of funding.

We expect the EGG program to be highly competitive and to attract academically outstanding students to UC Davis. Through the combination of existing campus financial commitments and significant extramural fundraising, it is expected that all EGG students will receive fellowship and research support.

The following summarizes the sources of expected support for EGG students:
Campus financial commitments: Significant fellowship support committed by the Deans of Engineering, Graduate Studies, and Agricultural and Environmental Sciences.

Corporate support: Development by the Energy Institute of corporate sponsorship of energy related research to support EGG students.

Existing fellowship opportunities: EGG students studying transportation-related energy issues will be eligible to compete for existing fellowship opportunities.

Faculty grants: Some EGG students may be funded on existing faculty research grants.

Extramural research funding: The Energy Institute will aggressively pursue interdisciplinary energy research grants from federal and state agencies, and foundations.

Campus Commitments. Many incoming students will be eligible for external and campus fellowships including those funded by the commitments described in letters from the Deans of Engineering, Graduate Studies, and Agricultural and Environmental Sciences found in Appendix A. Fellowship funding committed by those deans totals $350,000 over the first three years of the EGG program, after which time the Office of Graduate Studies will support the program through the Graduate Program Fellowship Allocation (with funding of $240,000 per year on the basis of expected EGG enrollment beginning in Year 4).

Corporate Support. Additional fellowship support for EGG students is expected to be raised from extramural sources by the Energy Institute. One strategy will be for the Energy Institute to adopt the successful modeled developed by the Institute of Transportation Studies (ITS-Davis) that provides fellowship support through its Corporate Affiliate Program for students studying transportation issues. Through that program, affiliate members of ITS-Davis make major gifts to support core programs and include members such as: BMW, BP, ExxonMobil, Daimler, Nissan, Shell, Toyota, and PG&E. The Energy Institute will be able to leverage these corporate connections as it works with affiliated research centers in the Energy Hub to raise new funding sources for EGG student fellowships.

Existing Fellowship Opportunities. Moreover, to the extent that any EGG students have research interests in transportation-related energy issues, they may also be eligible to apply for existing fellowships offered by ITS-Davis or by affiliated research centers, such as the National Center for Sustainable Transportation (NCST). NCST is co-located with the Energy Institute at the Energy Hub at West Village and is funded by the U.S. Department of Transportation (with match funding from the California Air Resources Board, California Department of Transportation, and California Energy Commission) at $11.2 million over four years.

Faculty Grants. Some EGG students will also likely be funded through existing faculty research grants focused on energy topics. In some instances, this may be to the exclusion of existing students in other departments on campus, but in others, faculty will likely be able to fund additional students due to the increased capabilities that EGG student researchers will provide. For more details about the extent to which faculty envision including EGG students on existing research grants, see the letters of support from EGG faculty in Appendix B.

Extramural Research Funding. The final source of expected funding for EGG students will come from research grants to fund interdisciplinary energy research. The Energy Institute will aggressively identify and pursue targets external sources of research funding, such as research grants from federal and state agencies or from foundations. The sub-section below provides an overview of the federal and state energy research trends.
foundations, and a range of other agencies and organizations. Funding decisions related to Research Assistantships are made by the Principal Investigator of the source of funding.

12) **PELP, In Absentia and Filing Fee status.**

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

13) **Leaving the Program Prior to Completion of the Ph.D. Requirements.**

Should a student leave the program prior to completing the requirements for the Ph.D., they may still be eligible to receive the M.S. degree if they have fulfilled all the requirements necessary for that degree (see M.S. degree requirements section). Students can use the Change of Degree Objective form available from the Registrar's Office to initiate this process: [http://registrar.ucdavis.edu/local_resources/forms/D065-graduate-major-degree-change.pdf](http://registrar.ucdavis.edu/local_resources/forms/D065-graduate-major-degree-change.pdf).