UC Davis Department of Civil and Environmental Engineering

PhD Program Overview

September 25, 2018
PhD Overview

The PhD consists of:

1. Coursework (Years 1 & 2)
2. The Qualifying Exam (2\textsuperscript{nd} or 3\textsuperscript{rd} year)
3. Your Dissertation & Exit Seminar
4. Hard work
PhD Coursework Requirements

<table>
<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework beyond baccalaureate exclusive of seminars and research* ×</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td>Minimum number of units taken on the UCD campus</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Maximum number of units that can be applied from a Masters Degree</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Minimum number of graduate course units</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Programs of study with one minor</td>
<td>30 min</td>
<td>15 min</td>
</tr>
<tr>
<td>Programs of study with two minors</td>
<td>27 min</td>
<td>12 min per minor</td>
</tr>
<tr>
<td>ECI 290 Seminar (1 unit not counted toward the unit requirement)</td>
<td></td>
<td></td>
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</tbody>
</table>

* ECI 296, prerequisite courses, S/U Graded courses do not meet these requirements.

 × Must meet core course requirements
PhD Coursework

1. 54 units total ~ 13.5 courses
   • Generally take 2 or 3 courses per quarter
   • 2 per quarter $\rightarrow$ 7 quarters
     • Allows more time to get started on research
   • 3 per quarter $\rightarrow$ 5 quarters

2. Major: your primary field of study
   • Typically, this is the name of your area (e.g. Environmental)
   • Must be coherent

3. Minor(s): complementary to your major
   • Commonly involves courses outside CEE
   • Examples: statistics, math, economics, geology, chemistry, atmospheric science, microbiology, or a sub-discipline in your field
PhD Program of Study

• Your coursework roadmap. Create a draft as soon as possible in consultation with your major professor
• Must be signed by your PoS committee (3 CEE faculty) and reviewed and approved by GPC
  • Talk with your MP about who should be on your PoS committee
• Must submit preliminary PoS for approval by the second quarter of entering the Ph.D. program at the latest
• Submit final PoS for approval after completing all coursework, or in last quarter when you are taking courses.
  • Must be done prior to taking the Qualifying Exam.
• Ph.D. Program of Study forms available on the CEE website:
  [http://cee.engr.ucdavis.edu/graduate-resources](http://cee.engr.ucdavis.edu/graduate-resources)
# Sample PhD Program of Study

**Department of Civil & Environmental Engineering**

## Title of Major: Geotechnical Engineering

<table>
<thead>
<tr>
<th>Course Title (abbreviate please)</th>
<th>Prefix</th>
<th>Number</th>
<th>School</th>
<th>Term &amp; Year</th>
<th>Non UCD Units</th>
<th>UCD Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECI 281E Geotechnical Earthquake Eng</td>
<td>ECI</td>
<td>175</td>
<td>UCD</td>
<td>F 06</td>
<td>4 UG</td>
<td>4 G</td>
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<tr>
<td>ECI 281A Advanced Soil Mechanics</td>
<td>ECI</td>
<td>281A</td>
<td>UCD</td>
<td>F 06</td>
<td>4 UG</td>
<td>4 B</td>
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<td>ECI 281B Advanced Soil Mechanics</td>
<td>ECI</td>
<td>281B</td>
<td>UCD</td>
<td>W 07</td>
<td>4 UG</td>
<td>4 A-</td>
</tr>
<tr>
<td>ECI 282 Pavement Design and Rehab</td>
<td>ECI</td>
<td>282</td>
<td>UCD</td>
<td>W 07</td>
<td>4 UG</td>
<td>4 A-</td>
</tr>
<tr>
<td>ECI 283S/283SA Physico-Chemical Influences</td>
<td>ECI</td>
<td>283</td>
<td>UCD</td>
<td>F 06</td>
<td>3 UG</td>
<td>3 A</td>
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<tr>
<td>ECI 284 Theoretical Geomechanics</td>
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<td>284</td>
<td>UCD</td>
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<tr>
<td>ECI 286 Advanced Foundation Design</td>
<td>ECI</td>
<td>286</td>
<td>UCD</td>
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<td>4 A</td>
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<tr>
<td>ECI 287 Geotechnical Earthquake Eng</td>
<td>ECI</td>
<td>287</td>
<td>UCD</td>
<td>S 07</td>
<td>4 A-</td>
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<tr>
<td>ECI 289E Prob. Seismic Hazard Analysis</td>
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<td>289E</td>
<td>UCD</td>
<td>F 07</td>
<td>3 A</td>
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<tr>
<td>ECI 288 Earth and Rockfill Dams</td>
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<td>UCD</td>
<td>W08</td>
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<td></td>
</tr>
</tbody>
</table>

| **Total** | 0 | 0 | 4 | 34 |

## Title of Minor: Microbiology

<table>
<thead>
<tr>
<th>Course Title (abbreviate please)</th>
<th>Prefix</th>
<th>Number</th>
<th>School</th>
<th>Term &amp; Year</th>
<th>Non UCD Units</th>
<th>UCD Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC 107 General Bacteriology</td>
<td>MIC</td>
<td>107</td>
<td>UCD</td>
<td>F 07</td>
<td>4 UG</td>
<td>4 A</td>
</tr>
<tr>
<td>MIC 200B Advanced Bacteriology</td>
<td>MIC</td>
<td>200B</td>
<td>UCD</td>
<td>W 08</td>
<td>4 UG</td>
<td>4 A</td>
</tr>
<tr>
<td>MIC 205L Bacterial Diversity Lab</td>
<td>MIC</td>
<td>205L</td>
<td>UCD</td>
<td>W 08</td>
<td>3 UG</td>
<td>3 A</td>
</tr>
<tr>
<td>ECI 243S/243SA Inorganic Environ Chemistry</td>
<td>ECI</td>
<td>243S</td>
<td>UCD</td>
<td>S 04</td>
<td>4 A-</td>
<td></td>
</tr>
<tr>
<td>ECI 248 Biosfilms Process</td>
<td>ECI</td>
<td>248</td>
<td>UCD</td>
<td>S 08</td>
<td>4 A</td>
<td></td>
</tr>
</tbody>
</table>

| **Total** | 0 | 0 | 7 | 12 |

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ECI 290 (quarter/year taken or attach waiver) | Fall 2006

1st Year

**General Requirements**

| Total Units | 57 | ≥ 54 |
| UCD Units | 37 | ≥ 30 |
| Grad Units | 46 | ≥ 40 |

**When 1 Minor**

| Total Units | 58 | ≥ 30 |
| Major Units | 34 | ≥ 24 |

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CEE Requirements:

- See the most recent Guidance Manual for Graduate Students and their Advisors
- Do not include 290, 290C and 299 Units
- Courses taken more than 8 years prior to Qualifying Exams are not normally considered eligible for Program of Study

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Approved by Graduate Study Committee

Original | Revision 8 | Indicate changes below and attach previous Program of Study

Psha changed to Probabilistic Seismic Hazard Analysis for course ECI 289E.

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Reported by: [Name]

Date: [Date]
PhD Qualifying Exam

• You are expected to take your QE by the end of 2\textsuperscript{nd} year or early in 3\textsuperscript{rd} year
  • If you already have an MS, you should plan on Y2
  • If you do not have an MS, you should plan on Y3 (or earlier)
  • Talk to your MP about exact timing
• Must have completed all coursework first (up to two courses taken concurrent).
• Requires written research prospectus and oral presentation and oral exam
• Written Prospectus
  • Lays out your proposed research, ideally with preliminary results
  • Typically \textasciitilde10 pages
  • Talk with your QE Committee Chair about format
  • Submit to committee three weeks before exam
PhD Qualifying Exam

• Oral Exam
  • 3 hours
  • Includes oral presentation
  • Coursework-related questions
  • Schedule well in advance (2-3 months)...hard to schedule in summer
  • Study
  • Consider asking friends/older grad students to conduct a mock exam

• Oral Presentation
  • Part of the oral exam
  • Typically 15-20 minutes straight through
  • Prepare to be interrupted
  • Builds off your written prospectus
  • Practice

https://gradstudies.ucdavis.edu/current-students/forms-information
PhD Qualifying Exam

• The QE Committee
  • 5 members
    • Determine with your major professor
  • Chair
    • must be from CEE Grad Group
    • Cannot be your major professor
  • Probably includes your PoS Committee members
  • At least 3 members from CEê Grad Group
  • At least 1 external member
  • Can include your major professor

• Must submit form for approval by Grad Studies
  • Submit at same time that you schedule your exam (one month or earlier)

https://gradstudies.ucdavis.edu/current-students/forms-information
Dissertation

• Constitute a Dissertation committee after passing your QE
  • 3 members (at minimum)
    • Major professor (chair)
    • At least one other CEE member
    • If non-faculty, requires exception (aka forms!)
  • *Engage your committee early and often* (not only your MP)
• Dissertation = a written documentation of the academic research you have done as a Ph.D. student
• Talk with your major professor early on about expectations
• Everyone’s dissertation is different
  • Some are very focused and build on one constant theme
  • Others cover multiple topics
Dissertation

• *Typical* length?
  • Introduction, linking everything together
  • Approximately 3 publishable units (i.e. main chapters)
  • No specific page requirement
• Strict formatting requirements (see Grad Studies website)
• Provide to committee *at least* 1.5 months prior to expected graduation
  • Typically, first reach consensus with your MP, then you can send to other members...but okay to talk with them about your work early!
  • they have 1 month to return it to you and you have to respond to comments, questions, etc.
Exit Seminar

- Presented in the quarter you submit the dissertation to the committee or in your last quarter
- Talk with your MP about structure
  - Everything? The most exciting aspect? Hard to pack it all into one presentation
- Must provide a seminar announcement at least 1 week before the seminar (send to Lauren for distribution)
  - Title
  - Date
  - Time and Location
Select four courses from the following six categories:

- ENG 103 (Fluid Mechanics)
- ENG 104 (Mechanics of Materials)
- ENG 105 (Thermodynamics) or Chem 110C or Chem 107A or Chem 107B
- ECI 141 (Engineering Hydraulics)
- ECI 115/189E (Computer Methods in Civil and Environmental Engr.)
- ECI 114 (Probabilistic Systems Analysis)

Including at least two of the following three classes:

- ENG 103 (Fluid Mechanics)
- ENG 104 (Mechanics of Materials)
- ENG 105 (Thermodynamics)

And 6 additional upper division engineering course units (minimum of 2 courses) approved by the student’s major professor or GPC Rep.

These do not count towards the degree requirements.
PhD Timeline

Year 1:
- Coursework + initial research
- Preliminary program of study by winter

Year 2:
- Coursework + research
- Identify and ask QE committee
- Final program of study (when courses are done)
- If you have an MS already:
  - Write prospectus in Winter
  - Take QE in Spring

Year 3:
- If no MS, write prospectus and take QE
- Research

Year 4:
- Research + begin dissertation

Year 5:
- Research + final dissertation + Exit Seminar
Path to the PhD

• You will find that there are many challenges along the way
• Be proactive in finding/asking for help when you need it
• Build a cohort you can talk with
• Don’t isolate yourself
• You must be your best advocate

Jorge Cham @The Stanford Daily