Development Engineering

The Designated Emphasis in Development Engineering is an interdisciplinary training program for UC Berkeley doctoral students whose dissertation research includes topics related to the application of technology to address the needs of people living in poverty. Through coursework, research mentoring, and professional development, the program prepares students to develop, pilot, and evaluate technological interventions designed to improve human and economic development within complex, low-resource settings. The DE serves students across engineering disciplines, quantitative social science disciplines (including public health), business programs, information sciences, and natural sciences.

The program builds upon ongoing research in technological innovations, human-centered design, development economics, remote sensing and monitoring, data science, and impact analysis at UC Berkeley. The program is overseen by the Graduate Group in Development Engineering, administered by the Department of Civil and Environmental Engineering, and affiliated with:

- Blum Center for Developing Economies (http://blumcenter.berkeley.edu)
- Center for Effective Global Action (CEGA) (http://cega.berkeley.edu)
- Technology and Infrastructure for Emerging Regions (TIER) (http://tier.cs.berkeley.edu/drupal)
- Development Impact Lab (DIL) (http://dil.berkeley.edu)

This constellation of affiliates—through DIL—is a cornerstone partner in USAID’s Global Development Lab (http://www.usaid.gov/GlobalDevLab). As such, development engineering students are connected to an ecosystem of researchers and practitioners at Berkeley and also have access to a dynamic global network. To review the development engineering research projects sponsored by DIL, we encourage you to explore the DIL Technology Portfolio (http://dil.berkeley.edu/technology-portfolio).

To be admitted to the Designated Emphasis in Development Engineering, an applicant must already be accepted into a PhD program at the University of California, Berkeley. Before applying for the DE, interested PhD students should arrange a consultation meeting with one of the development engineering faculty advisers. Students must apply at least one semester before their PhD qualifying examination. Admission to the Designated Emphasis in Development Engineering is determined by the development engineering faculty advisers on a rolling basis throughout one semester before their PhD qualifying examination. PhD students should arrange a consultation meeting with one of the development engineering faculty advisers for a letter grade. See program website (http://deveng.berkeley.edu) for more information.

### Required Courses

- DEV ENG C200 Design, Evaluate, and Scale Development Technologies 3
- DEV ENG 210 Development Engineering Research and Practice Seminar 2

### Development Engineering Electives: Three electives from at least two of the thematic modules.

#### Problem Identification and Project Design

- CIV ENG 209 Design for Sustainable Communities 3
- DEVP 225 Innovation, Product Development, and Marketing 3
- DEVP C232 Foundations of Public Health 2
- INFO 213 User Interface Design and Development 4
- INFO 214 Needs and Usability Assessment 3
- INFO 272 Qualitative Research Methods for Information Systems and Management 3
- MBA 215 Business Strategies for Emerging Markets: Management, Investment, and Opportunities 3
- MEC ENG 290H Green Product Development: Design for Sustainability 3
- MEC ENG 290P New Product Development: Design Theory and Methods 3
- PB HLTH 290 Health Issues Seminars (Designing Innovative Public Health Solutions) 3

#### Evaluation Techniques and Methods for Measuring Social Impact

- DEV ENG 290 Advanced Special Topics in Development Engineering 1-3
- DEVP 228 Strategic Planning and Project Management 3
- ECON 219B Applications of Psychology and Economics 3
- ECON 240A Econometrics 5
- ECON 240B Econometrics 4
- ECON C270A Microeconomics of Development 3

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4. Letter of recommendation from a member of the development engineering faculty graduate group or the student’s graduate adviser.

For further information regarding admission to graduate programs at UC Berkeley, please see the Graduate Division’s Admissions website (http://grad.berkeley.edu/admissions).

* If you have applied to InFEWs, you will have submitted these documents except the timeline and courses. Please submit that within one year of the InFEWs application.

### Coursework/Curriculum

The Designated Emphasis in Development Engineering requires a total of five courses, comprised of two core courses and three electives. Electives must be selected from the areas listed below: 1) Problem Identification and Project Design, 2) Evaluation Techniques and Methods for Measuring Social Impact, and 3) Development Technologies. The three electives must span at least two areas. Only one course can be from the student’s home department. All course work should be taken for a letter grade. See program website (http://deveng.berkeley.edu) for more information.

- **Required Courses**
  - DEV ENG C200 Design, Evaluate, and Scale Development Technologies 3
  - DEV ENG 210 Development Engineering Research and Practice Seminar 2

- **Development Engineering Electives: Three electives from at least two of the thematic modules.**

- **Problem Identification and Project Design**
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  - DEVP 225 Innovation, Product Development, and Marketing 3
  - DEVP C232 Foundations of Public Health 2
  - INFO 213 User Interface Design and Development 4
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  - INFO 272 Qualitative Research Methods for Information Systems and Management 3
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  - MEC ENG 290H Green Product Development: Design for Sustainability 3
  - MEC ENG 290P New Product Development: Design Theory and Methods 3
  - PB HLTH 290 Health Issues Seminars (Designing Innovative Public Health Solutions) 3

- **Evaluation Techniques and Methods for Measuring Social Impact**
  - DEV ENG 290 Advanced Special Topics in Development Engineering 1-3
  - DEVP 228 Strategic Planning and Project Management 3
  - ECON 219B Applications of Psychology and Economics 3
  - ECON 240A Econometrics 5
  - ECON 240B Econometrics 4
  - ECON C270A Microeconomics of Development 3
Development Technologies (Appropriate Technologies, Sensors, Data Collection, Data Mining and Analysis)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO ENG 168L</td>
<td>Practical Light Microscopy</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENG 271</td>
<td>Sensors and Signal Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENG 290</td>
<td>Advanced Special Topics in Civil and Environmental Engineering (Control Market and Privacy Tools for Participatory Sensing)</td>
<td>1-3</td>
</tr>
<tr>
<td>COMPSCI 289A</td>
<td>Introduction to Machine Learning</td>
<td>4</td>
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<tr>
<td>COMPSCI 294</td>
<td>Special Topics (Behavioral Data Mining)</td>
<td>1-4</td>
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<tr>
<td>ECON 291/ENGIN 298B</td>
<td>Departmental Seminar (Behavior Management and Change)</td>
<td>1</td>
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<tr>
<td>INFO 271B</td>
<td>Quantitative Research Methods for Information Systems and Management</td>
<td>3</td>
</tr>
<tr>
<td>INFO 283</td>
<td>Information and Communications Technology for Development</td>
<td>3</td>
</tr>
<tr>
<td>INFO 290</td>
<td>Special Topics in Information</td>
<td>1-4</td>
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Qualifying Examination

All students must apply and be accepted to the Designated Emphasis in Development Engineering at least one semester before their qualifying examination. At least one faculty member of development engineering must participate in the qualifying examination committee and will evaluate the exam from relevant perspectives. Satisfactory performance on the qualifying examination for the PhD will be judged according to the established rules in the student's home department. Forms must be submitted with approval from both the department and the designated emphasis, at least one month in advance of the exam. For more details, please see the website (http://deveng.berkeley.edu/#quals).

If none of the faculty advisers/committee members on your qualifying exam or dissertation are in the Graduate Group in Development Engineering, consider encouraging one of them to apply for membership in the Graduate Group in Development Engineering. The faculty should contact the faculty chair (see Contact Information tab on right sidebar).

Advancing to Candidacy

Students must have a designated emphasis member on the dissertation committee as well as obtaining the approval of the designated emphasis Head Graduate Advisor at the time of applying for candidacy.

Dissertation

The dissertation must contain themes relevant to the field of Development Engineering (e.g., technology for economic and social development). The student's dissertation committee must include at least one faculty in development engineering who can evaluate the dissertation from relevant perspectives.