1

Development Engineering

The Designated Emphasis in Development Engineering (DE in Dev Eng) 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 in Dev Eng 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 through 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, Dev Eng 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 the Development Engineering Graduate Student Affairs Officer in the Department of Civil and Environmental Engineering as well as one of the Development Engineering Faculty Advisors. 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 Advisors on a rolling basis throughout the academic year.

After the initial consultation meeting, a student must first submit an application in hard copy to the Development Engineering Graduate Student Affairs Officer in the Department of Civil and Environmental Engineering, and then confirm by email to the Development Engineering Faculty Advisor (who advised the student prior to student's application), and to the Development Engineering Chair. The application must contain:

1. Petition for Admission to the Designated Emphasis in Development Engineering

- 2. Letter of intent summarizing research interests and educational or employment background in issues related to development economics or development engineering
- Letter of recommendation from a member of the Development Engineering faculty graduate group or the student's graduate advisor
- 4. Graduate Petition for Change of Major or Degree Goal (to indicate your interest in adding the Designated Emphasis)

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

Coursework/Curriculum

Two core courses:

Design, Evaluate and Scale Development Technologies

Development Engineering Research and Practice Seminar

Electives:

Three electives from at least two of the three thematic modules that the program is organized around (see below); only one can be from the student's major (or field)

Human Centered Design

CIV ENG 209	Design for Sustainable Communities	3
DEVP 225	Innovation, Product Development, and Marketing	3
DEVP 228	Strategic Planning and Project Management	3
DEVP C232	Foundations of Public Health	2
ECON 219B	Applications of Psychology and Economics	3
INFO 213	User Interface Design and Development	4
INFO 214	Needs and Usability Assessment	3
INFO C283	Information and Communications Technology for Development	3
INFO 287	Information and Communications Technologies for Social Enterprise	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 Pubic Health Solutions)	3

Evaluation Techniques and Methods for Measuring Social Impact

ECON 274	Global Poverty and Impact Evaluation	4
ECON 240A	Econometrics	5
ECON 240B	Econometrics	4
ECON 270A	Course Not Available	4
ECON 270B	Development Economics	3
INFO 272	Qualitative Research Methods for Information Systems and Management	3
MBA 292S	Social Sector Solutions: Social Enterprise	3

MBA 296	Special Topics in Business Administration (Applied	.5-3
	Impact Evaluation: How to Learn What Works to	
	Lower Global Poverty)	
PB HLTH 252C	Intervention Trial Design	3
PUB POL C253	International Economic Development Policy	3

Development Technologies (Appropriate Technologies, Sensors, Data Collection, Data Mining and Analysis)

	BIO ENG 168L	Practical Light Microscopy	3
	CIV ENG 290	Advanced Special Topics in Civil and Environmental Engineering	1-3
	CIV ENG 210	Course Not Available	4
	CIV ENG 271	Sensors and Signal Interpretation	3
	INFO 271B	Quantitative Research Methods for Information Systems and Management	3
	COMPSCI 289A	Introduction to Machine Learning	4
	COMPSCI 294	Special Topics (Behavioral Data Mining)	1-4
	ECON 291/ ENGIN 298B	Departmental Seminar (Behavior Management and Change)	1

Qualifying Examination

All students must apply and be accepted to the Designated Emphasis in Development Engineering <u>at least one semester before their qualifying</u> <u>examination</u>. At least one faculty member of the Graduate Group in 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. If you are a student interested in development engineering research but none of your faculty advisors / committee members are in the Graduate Group in Development Engineering, consider encouraging one of them to apply for membership in the Graduate Group in Development Engineering. They should contact the Faculty Chair of the Development Engineering Graduate Group.

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 member of the Graduate Group in Development Engineering who can evaluate the dissertation from relevant perspectives. If you are a student interested in development engineering research but none of your faculty committee members are in the Graduate Group in Development Engineering, consider encouraging one of them to apply for membership in the Graduate Group in Development Engineering. They should contact the Faculty Chair of the Development Engineering Graduate Group.