

# Want a Career that Changes the World?

UC Berkeley's Development Engineering Master Program

Applications due February 1, 2021 for inaugural Fall 2021 class:  
[developmentengineering.berkeley.edu](http://developmentengineering.berkeley.edu)

Three-semester, 15-month program merging professional training in technology and development to launch changemaking careers in social impact, social entrepreneurship, and sustainability

Cross-cutting curriculum in: design and management of technology, application of emerging technologies, evidence-based assessment techniques, economic development, social problem solving, cross-cultural collaboration, and community engagement

Team-oriented experiential learning through summer internship and a final project

Dedicated career development team to guide you through your job search

World-class Engineering, Social Science, and Natural Science faculty and research facilities

Beautiful San Francisco Bay Area setting & Silicon Valley entrepreneurial culture

# The UC Berkeley Master in Development Engineering responds to...



---

the need for Development Engineers to solve complex societal challenges in and across the for-profit, nonprofit, and public sectors.



---

the demand for diverse STEM professionals who can invent, adapt, and implement technologies to benefit communities in need locally and globally.

## The 21st Century needs Development Engineers because...

Today's globalized world is filled with complex problems to which there are no obvious solutions. Problems such as securing access to food in an era of climate change, securing protective gear during a pandemic, providing universal housing amidst rapid urbanization, and determining ways to provide consumers with low-carbon energy sources all require innovative thinking and action.

As social entrepreneur Paul Polak argued, over 90 percent of the world's design efforts are aimed at 10 percent of the population. The people who need game-changing solutions are not engaged with the innovation process, while significant resources are being spent on solving the wrong problems. Development Engineering and Development Engineers are designed to change that.



# Master of Development Engineering Program Design

The Master of Development Engineering fosters “T-shaped” professionals who have a broad base of general skills and deep knowledge in one area. The broad skills include the design and management of technology, knowledge of emerging technologies, evidence-based assessment techniques, economic development, and community engagement.

## BREADTH

Ethics & Reflection, Data Analysis, Social Entrepreneurship, Communication, Design Thinking, Systems Thinking, Critical Thinking

## CONCENTRATIONS

Sustainable Design

Healthcare

AI/Data Analytics

Energy, Water, Environment

Self-Designed

## Students choose a Concentration Area in...

### Sustainable Design Innovations

Students take courses on sustainable design and social entrepreneurship, including principles of green design, the science of sustainability, resilient communities, sustainable economic models, green chemistry, product design, spatial modeling, affordable housing, public transportation, and equitable development.

### Healthcare Transformations

Students take courses on the rapidly evolving landscape of global healthcare technologies and practices, including biomedical device design, health policy, health impact assessment, and the digital transformation of health care.

### AI/Data Analytics for Social Impact

Students take courses on how artificial intelligence, machine learning, and data tools and analytics provide the social, civic, and international development sectors actionable insights.

### Energy, Water, and the Environment

Students take courses on core natural resource challenges—water and energy systems and their impact on the environment—and on life cycle assessment, water resource management, agricultural impact, and energy technologies and policies.

### Self-Designed Concentration

If a student has interests outside of these areas, it is possible to devise a Self-Designed Concentration in, for example, gender equity, global education, or technology, development and policy.

# Master of Development Engineering Courses

## DevEng C200 | Design Evaluate & Scale Development Technologies

The course provides project-based learning experience in the development of human-centered products, services, or systems. The course teaches the mindsets, skill sets, and toolsets of design thinking with a focus on its use in development. The course is focused around the following modules that cover core phases of the design process: observe and notice, frame and reframe, imagine and design, and make and experiment. Students will also learn the theory of change and methods for assessing potential impact of technology interventions. Students will be expected to learn ethnographic interviewing, webs of abstraction, ideation, and basics of both hardware and software prototyping. The course will engage social impact designers from industry as speakers and coaches.

## DevEng 202 | Critical Systems of Development

This course is intended to provide students in the Master of Development Engineering with the necessary background and knowledge to undertake projects and work experience of a global scope. Students will be exposed to a diversity of methodological frameworks, introduced to the skills needed to effectively participate in the sustainable development field (such as systems mapping and landscape analysis), and to understand the history and ethics of global development. Students will be required to complete an annotated bibliography and a systems analysis of a problem of interest.

## DevEng 202 | Critical Systems of Development

This course is intended to provide students in the Master of Development Engineering with the necessary background and knowledge to undertake projects and work experience of a global scope. Students will be exposed to a diversity of methodological frameworks, introduced to the skills needed to effectively participate in the sustainable development field (such as systems mapping and landscape analysis), and to understand the history and ethics of global development. Students will be required to complete an annotated bibliography and a systems analysis of a problem of interest.

## DevEng 203: Digital Transformation of Development

As technology use proliferates globally, there exists significant potential leverage to further understand and improve the lives and livelihoods of people in low-resource settings. Through a careful reading of recent research and through hands-on analysis of large-scale datasets, this course introduces students to the opportunities and challenges for data-intensive approaches to development. Students should be prepared to dissect, discuss, and replicate academic publications from several fields, including development economics, machine learning, information science, and computational social science. Students also will conduct original statistical and computational analysis of real-world data. They will gain an introduction to sensors as well as tools and methods for spatial modeling and spatial data analysis.

# Master of Development Engineering Courses

## DevEng 204: Introduction to Social Entrepreneurship

Social entrepreneurship entails market-oriented approaches to address social problems for sustainable, scalable outcomes. This course will enable students to frame complex problems and devise entrepreneurial approaches for addressing them. Students study the dynamics of societal challenges and the conceptual framework of social innovation and social entrepreneurship from theoretical and practical perspectives. Students also explore technology solutions to address global social problems with a systems thinking approach. Students additionally learn how to develop appropriate business models and implementation strategies for a social venture. Student projects will integrate the development engineering goals of creating technology interventions designed to improve human and economic development in complex low-resource settings. This course is the first of a sequence of two final project courses for candidates of the Master of Development Engineering.

## DevEng 205: Development Engineering Applications

This course is the second of a sequence of two final project courses for candidates of the Master of Development Engineering. Students engage in professionally oriented independent or group projects under the supervision of an advisor. The projects integrate the development engineering goals of creating technology interventions designed to improve human and economic development within complex low-resource settings.

## DevEng 206: Ethical Reflection and Portfolio Building

This course is intended to provide students with a forum for reflection on the Summer Internship component of the Master of Development Engineering as well as projects worked on to date. Topics covered by the course will include issues of power and privilege, civic engagement, political/public policy contexts, tensions between tourism vs. travel, and community service vs. engagement. Students will discuss and produce an op-ed on an issue of interest. Students will also develop a portfolio to capture their individual point of view and skill sets developed in the MDevEng.

## DevEng 290: Perspectives on Development Engineering

Perspectives on Development Engineering: Development Engineering represents a new interdisciplinary field that integrates engineering, economics, business, natural resource development, and social sciences to develop, implement, and evaluate new technological interventions that address the needs of people living in poverty in developing regions and low-income areas of the United States. This seminar, offered once per year, will feature guest lecturers with insightful perspectives on the emergent field. The DevEng 290 series covers current topics of research interest in development engineering. The course content may vary from semester to semester. All topics will address the development engineering goals of developing technology interventions designed to improve human and economic development within complex, low-resource settings.

# Sample Programs

---

## Concentration: Energy, Water, and the Environment

	Semester 1	Semester 2	Summer	Semester 3
Courses	DevEng 200C: Design, Development Technologies	DevEng 203: Digital Transformation	Internship / Practice Experience	DevEng 205: Engineering Capstone Project
	DevEng 202: Critical Systems of Development	Dev Eng 204: Social Entrepreneurship		DevEng 206: Ethical Reflection
	CE 268E: Life-Cycle Assessment	ENERES 274: Water and Development		DevEng 290: Perspectives on Dev Eng
	ENERES 200: Energy and Society	CE 206: Water Resources Management		ESPM 271: Remote Sensing
				ENERES C221: Climate Change

## Concentration: AI/Data Analytics for Social Impact

	Semester 1	Semester 2	Summer	Semester 3
Courses	DevEng 200C: Design, Development Technologies	DevEng 203: Digital Transformation	Internship / Practice Experience	DevEng 205: Engineering Capstone Project
	DevEng 202: Critical Systems of Development	Dev Eng 204: Social Entrepreneurship		DevEng 206: Ethical Reflection
	ESPM 271: Remote Sensing	Info 288: Data and Development		DevEng 290: Perspectives on Dev Eng
	Info 188: Humans and Values	Pub Health 290: Impact Evaluation		ESPM 157: Ecology Data Science
				CYPLAN 257: Socio-Technical Systems

# Development Engineering Faculty

---

The faculty of the Master of Development Engineering are award-winning teachers who do applied research in water and sanitation, agricultural engineering, climate modeling, mobile microscopy, human-centered design, remote sensing and monitoring, big data science, machine learning, economic development, and impact analysis.

The Master of Development Engineering is offered by the Graduate Group in Development Engineering, an interdisciplinary coalition who hail from over a dozen top rated schools and departments, including the College of Engineering (ranked third nationally and seventh globally), the College of Natural Resources (ranked first nationally for environment and ecology studies), School of Information, School of Public Health (ranked ninth nationally), Haas School of Business (ranked seventh nationally), and College of Environmental Design.



Charisma Acey  
Assistant Professor  
City and Regional Planning



Alice Agogino  
Roscoe and Elizabeth Hughes  
Professor of Mechanical  
Engineering  
Education Director, Blum Center for  
Developing Economies



Sara Beckman  
Senior Lecturer  
Earl F. Cheit Faculty Fellow  
Haas School of Business



Joshua Blumenstock  
Assistant Professor  
School of Information Director,  
Data-Intensive Development Lab



Clair Brown  
Professor Emeritus  
Economics



Jenna Burrell  
Associate Professor  
School of Information



John Canny  
Paul and Stacy Jacobs  
Distinguished Professor of  
Engineering  
Computer Science/EECS



Jack Colford  
Professor  
Public Health



Daniel Fletcher  
 Chief Technologist, Blum Center  
 for Developing Economies  
 Chatterjee Chair in Engineering  
 Biological Systems  
 Bioengineering



Ashok Gadgil  
 Andrew and Virginia Rudd Family  
 Foundation  
 Professor of Safe Water and  
 Sanitation  
 Civil and Environmental Engineering



Paul Gertler  
 Li Ka Shing Foundation Chair  
 in Health Management  
 Haas School of Business



M. Paz Gutierrez  
 Associate Professor  
 Architecture



Daniel Kammen  
 Professor  
 Energy and Resources Group  
 Founding Director of Renewable  
 and Appropriate Energy  
 Laboratory



G. Mathias Kondolf  
 Professor of Landscape Architecture  
 & Environmental Planning  
 College of Environmental Design



David Levine  
 Eugene E. and Catherine M.  
 Trefethen Chair in Business  
 Administration  
 Haas School of Business



Baoxia Mi  
 Associate Professor  
 Civil and Environmental Engineering



Kara Nelson  
 Professor  
 Civil and Environmental  
 Engineering



Grace O'Connell  
 Associate Professor  
 Mechanical Engineering



Amy Pickering  
 Assistant Professor  
 Development Engineering



Kameshwar Poola  
 Professor  
 Mechanical Engineering



Matthew Potts  
 Associate Professor  
 Department of Environmental  
 Science, Policy, and Management  
 S. J. Hall Chair in Forest  
 Economics



Michael Ranney  
 Professor  
 Graduate School of Education



Ben Recht  
 Associate Professor  
 Electrical Engineering and  
 Computer Science



Elisabeth Sadoulet  
 Professor  
 Agricultural and Resource  
 Economics  
 College of Natural Resources



S. Shankar Sastry  
 Professor  
 Electrical Engineering and  
 Computer Science  
 Faculty Director, Blum Center  
 for Developing Economies



Zuo-Jun (Max) Shen  
 Professor  
 Department of Industrial  
 Engineering and Operations  
 Research, Department of Civil and  
 Environmental Engineering



S. Leonard Syme  
 Professor Emeritus  
 Epidemiology and Community  
 Health



Sarah Vaughn  
 Assistant Professor  
 Department of Anthropology



Catherine Wolfram  
 Cora Jane Flood Professor of  
 Business Administration  
 Haas School of Business



David Zilberman  
 Professor Agricultural and  
 Resource Economics  
 College of Natural Resources



# Development Engineering Careers

---

The Master of Development Engineering prepares graduates for meaningful and forward-looking careers in the following

---

## Multilateral organizations

US Agency for International Development, United Nations, World Bank, World Health Organization

---

## Charitable foundations

Bill & Melinda Gates Foundation, Chan Zuckerberg Initiative, Omidyar Network, Google.org

---

## Government agencies

Municipal, national, federal

---

## Multinational companies

Honeywell, Google, Salesforce, Facebook, Bechtel, Amazon

---

## Nongovernmental organizations

CARE, Mercy Corps, BRAC, Nature Conservancy, Red Cross, Salvation Army, Doctors Without Borders

---

## Social enterprises

Creative Reaction Lab, Build Change, Sanergy, One Acre Fund, Dimagi, Medic Mobile -- or found and run your own!

## Job Titles

- Global Impact Program Manager
- Foreign Service Program Officer
- Sustainable Product Designer
- Environmental Engineer
- Digital Innovation and Scaling Specialist
- Energy and Climate Research Analyst
- AI Ethics Strategist
- Technology and Innovation Advisor
- Social Impact Project Lead
- Data Analyst for Social Impact Partnerships
- Corporate Social Responsibility Lead
- Technical Director of Sustainable Innovation
- Sustainable Strategy Consultant

# To Learn More About the Master of Development Engineering

---

## **Admissions:**

Alice M. Agogino, Education Director; Professor of Mechanical Engineering

## **Academic Advising and Career Guidance:**

Alice M. Agogino, Education Director; Professor of Mechanical Engineering

Yael Perez, Ph.D., Research Fellow, Advising Coordinator

## **Concentrations Advising:**

AI and Data Analytics: Shankar Sastry, Faculty Director; Professor of Electrical Engineering & Computer Sciences

Energy, Water, and the Environment: Matthew D. Potts, Associate Director for Sustainable Development; Professor of Environmental Science, Policy & Management

Sustainable Design Innovations: Alice M. Agogino, Education Director, Professor of Mechanical Engineering

Healthcare Transformations: Daniel Fletcher, Chief Technologist; Professor of Bioengineering

Alternative Concentrations: Rachel Dzombak, Ph.D. Innovation Fellow

## **Curriculum:**

Alice M. Agogino, Education Director; Professor of Mechanical Engineering

Rachel Dzombak, Ph.D. Innovation Fellow

## **Internships:**

Chetan Chowdhry, Director of Student Programs

Maryanne McCormick, Executive Director

## **Social Entrepreneurship Ecosystem:**

Phillip Denny, Director, Big Ideas Contest

(510) 643-5316

[devenginfo@berkeley.edu](mailto:devenginfo@berkeley.edu)

Blum Center for Developing Economies

The University of California, Berkeley

Blum Hall, #5570

Berkeley, CA 94720-5570