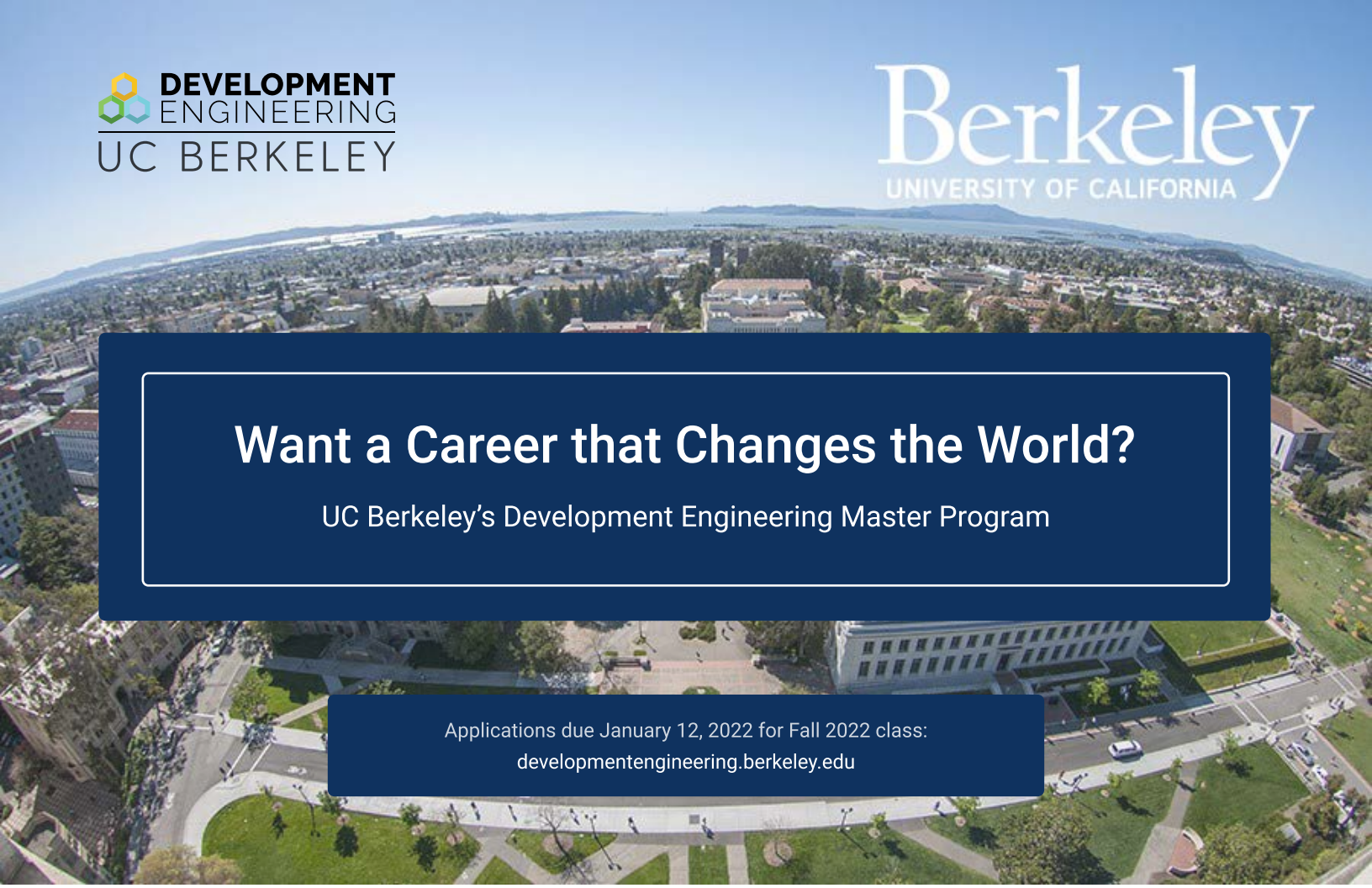
DEVELOPMENT ENGINEERING
UC BERKELEY

Berkeley
UNIVERSITY OF CALIFORNIA



Want a Career that Changes the World?

UC Berkeley's Development Engineering Master Program

Applications due January 12, 2022 for Fall 2022 class:
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.

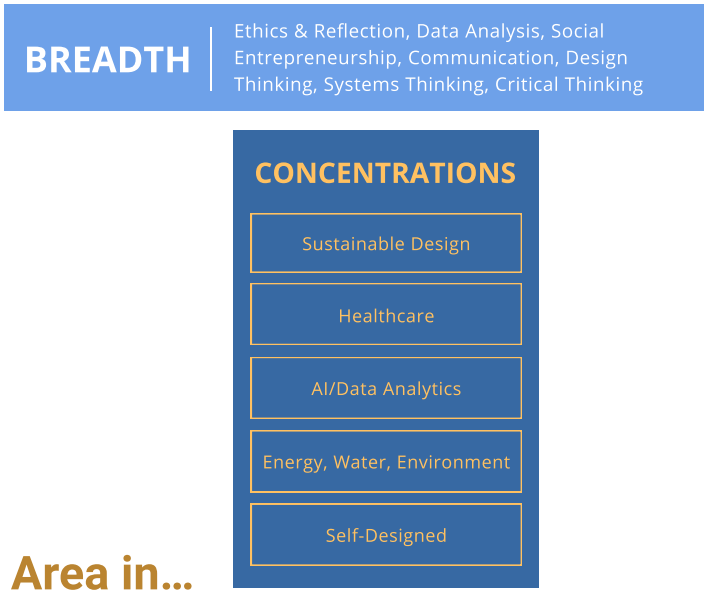
The 21st Century needs Development Engineers because…

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.



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.

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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 Managemennt		**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.

Rediet Abebe
Assistant Professor of Electrical Engineering and Computer Science

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

Hany Farid
Professor
I School and EECS

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 Gutlerrez
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 Poolla
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

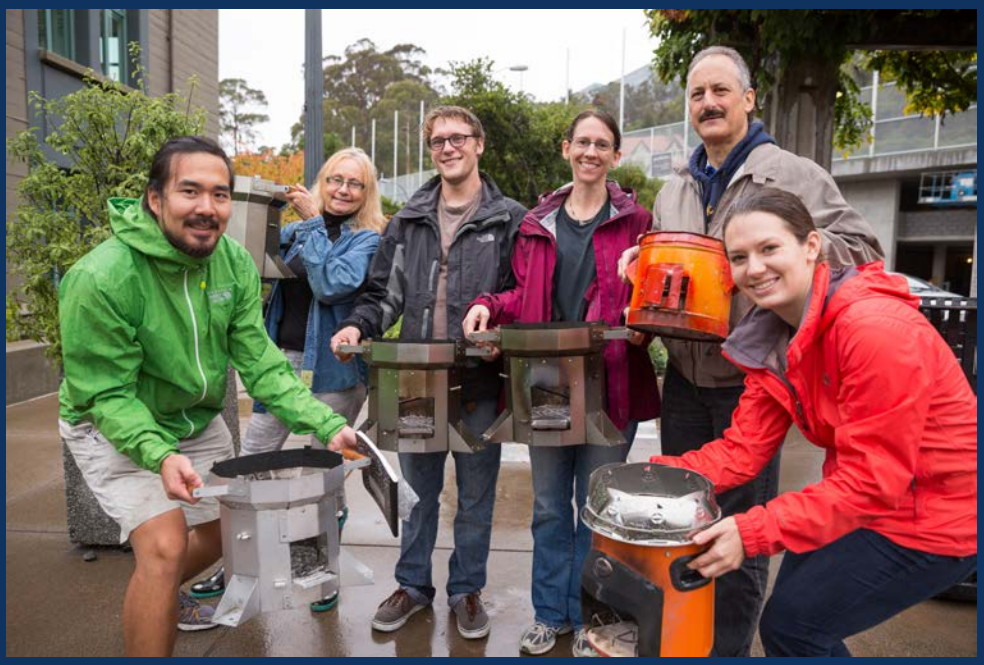
Zuo-Jun (Max) Shen
Professor
Department of Industrial Engineering and Operations Research, Department of Civil and Environmental Engineering

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

Internships:
Chetan Chowdhry, Director of Student Programs
Maryanne McCormick, Executive Director

Social Entrepreneurship Ecosystem:
Phillip Denny, Director, Big Ideas Contest

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