Designated Emphasis in Development Engineering and InFEWS

Fall 2019 Course Offerings

** denotes courses that are particularly relevant for InFEWS students

Core Courses (required for both DevEng & InFEWS):

DevEng C200: Design, Evaluate and Scale Development Technologies (3 units)
CCN: 27724
Time: TU, TH 9:30 am - 10:59 am
Instructors: Alice Agogino
Chou Hall N440

This required course for the Designated Emphasis in Development Engineering will include projects and case studies, many related to projects at UC Berkeley, such as those associated with the Development Impact Labs (DIL). Student teams will work with preliminary data to define the problem. They will then collect and analyze interview and survey data from potential users and begin to design a solution. Students will explore how to use novel monitoring technologies and "big data" for product improvement and evaluation. The student teams will use the case studies (with improvements based on user feedback and data analysis) to develop a plan for scaling and evaluation with a rigorous controlled trial.

Electives

Electives

Module 1:
Problem Identification and Project Design

Development Engineering 215: Global Poverty: Challenges and Hopes in the New Millennium
CCN: 28832
Time: Tu Th 2:00pm - 3:29pm - Valley Life Science 2050
Instructor: Brad DeLong & Fatmir Haskaj

> This class seeks to provide a rigorous understanding of 20th century development and thus 21st century poverty alleviation. Students will take a look at popular ideas of poverty alleviation, the institutional framework of poverty ideas and practices, and the social and political mobilizations that seek to transform the structures of poverty.
>
> DevEng 215 is a graduate version of the GPP 215 class, and will have separate enrollment.

Information 213: User Interface Design and Development
CCN: 27718
Time: TU, TH 12:30 pm - 1:59 pm
Instructor: Eric J Paulos
Units: 4

> The design, implementation, and evaluation of user interfaces. User-centered design and task analysis. Conceptual models and interface metaphors. Usability inspection and evaluation methods. Analysis of user study data. Input methods (keyboard, pointing, touch, tangible) and input models. Visual design principles. Interface prototyping and implementation methodologies and tools.

Development Practice C232: Foundations of Public Health
CCN: 26699
Time: Tu 9 – 11 AM Barrows 126
Instructor: George T. Scharffenberger, Arthur L Reingold

> The seminar will introduce core disciplines and concepts in public health, using a case-based, integrated approach. Examples of cases discussed include: respiratory disease and air pollution; tobacco control and prevention of smoking-related conditions; disease elimination or eradication via childhood immunization; environmental control and prevention of schistosomiasis; behavior change and prevention of HIV/AIDS; and novel economic approaches to improving healthcare delivery to impoverished groups.

Information 272: Qualitative Research Methods for Information Systems and Management
CCN: 32552
Time: NOT OFFERED IN FALL 2019
Instructor: Jenna Burrell

Theory and practice of naturalistic inquiry. Grounded theory. Ethnographic methods including interviews, focus groups, naturalistic observation. Case studies. Analysis of qualitative data. Issues of validity and generalizability in qualitative research.

ENERES 273 Research Methods in Social Sciences**
CCN: 31507
Time: TU, TH 12:30 pm - 1:59 pm Barrows 104
Instructor: Isha Ray

This course aims to introduce graduate students to the rich diversity of research methods that social scientists have developed for the empirical aspects of their work. Its primary goal is to encourage critical thinking about the research process: how we "know," how we match research methods to research questions, how we design and conduct our information/data collection, what we assume explicitly and implicitly, and the ethical dilemmas raised by fieldwork-oriented studies.

AFRICAM 134: Information Technology and Society – TBD
(contact pyael@berkeley.edu **if you would like to enroll to this class)**
CCN:26312
Time: M 2:00 pm - 4:59 pm Etcheverry 3111
Instructor: Michel S Laguerre
Units:4

This course assesses the role of information technology in the digitalization of society by focusing on the deployment of e-government, e-commerce, e-learning, the digital city, telecommuting, virtual communities, Internet time, the virtual office, and the geography of cyberspace. Course will also discuss the role of information technology in the governance and economic development of society.

Module 2:
Evaluation Techniques and Methods for Measuring Social Impact

Development Practice 222: Economics of Sustainable Resource Development**
CCN: 26697
Time: TU, TH 3:30 pm - 4:59 pm Dwinelle 88
Instructor: TBD

This course will introduce the basic concepts including economic welfare, externality, public good, global commons, policy approaches for dealing with externality, and techniques for quality analysis. It will include case studies where groups will design economic incentives and policy solutions to major problems. It will have sections on particular problems including climate change, water and air quality, animal waste, toxic contamination, forestry and fishery policy.

Development Practice 228: Strategic Planning and Project Management
CCN: 26698
Time: TH 4:00 pm - 5:59 pm Wheeler 102
Instructor: Omar Romero-hernandez

A pragmatic, interdisciplinary introduction to strategic planning and project management, introducing students to a portfolio of models, tools, and techniques drawn from the private, nonprofit, and public sectors. It will offer an opportunity through case studies, simulations and class projects to apply those approaches in settings relevant to the development field.

Economics 240: Econometrics
CCN: 21608
Time: MW 10:00 am - 11:59 am Wheeler 102
Units:5
Instructor: Bryan Graham and Michael Jansson

Basic preparation for the Ph.D. program including probability and statistical theory and the classical linear regression model.

Economics C270A: Microeconomics of Development
CCN: 26692
Time: TU, TH 4:00 pm - 5:59 pm Dwinelle 205
Units:3
Instructor: Jeremy Magruder and Marco Gonzalez-Navarro

Theoretical and empirical analyses of poverty and inequality, household and community behavior, and contract and institutions in the context of developing countries. The course is intended for second year ARE or Econ Ph.D. students. All students enrolling in the

course are required to have completed Econ 201A and a Ph.D. course in Econometrics before enrolling in Econ 270A.

Economics 271: Seminar in Development Economics
CCN:21612
M 4:00 pm - 5:59 pm Evans 648
Units:3
Instructor: Edward Miguel

Information 272: Qualitative Research Methods for Information Systems and Management
CCN: 32552
Time: NOT OFFERED IN FALL 2019
Instructor: Jenna Burrell

Theory and practice of naturalistic inquiry. Grounded theory. Ethnographic methods including interviews, focus groups, naturalistic observation. Case studies. Analysis of qualitative data. Issues of validity and generalizability in qualitative research.

Energy and Resources 276: Climate Change Economics**
CCN: 27134
Time: TTh 11:00am - 12:29pm, Dwinelle 145
Instructor: David Anthoff
Units:4

This course is a self-contained introduction to the economics of climate change. Climate change is caused by a large variety of economic activities, and many of its impacts will have economic consequences. Economists have studied climate change for more than two decades, and economic arguments are often powerful in policy decisions. The course will familiarize students with these arguments and equip them with the tools to participate in discussions of climate change policy through an economic lens.

Public Health 252C: Intervention Trial Design
CCN: 29471
Time: F 2:00pm - 4:59pm Genetics & Plant Bio 103
Instructor: Jack Colford, Alasdair Gordon Cohen
Units:3

Students learn (through lectures and graded student presentations and projects) to design clinical and population-level field trials. Topics: formulation of a testable hypothesis; identification of appropriate populations; blinding (including indices for assessment); randomization (including traditional and adaptive randomization algorithms); sample-size estimation; recruitment strategies; data collection systems; quality control and human subjects responsibilities; adverse effects monitoring; improving participant adherence; use of surrogate outcomes.

Public Policy/Agricultural and Resource Economics C253: International Economic Development Policy**
CCN: 29151
Time: W 12:00 pm - 1:59 pm GSPP 355
Instructor: Alain de Janvry
Units:3

This course emphasizes the development and application of policy solutions to developing-world problems related to poverty, macroeconomic policy, and environmental sustainability. Methods of statistical, economic, and policy analysis are applied to a series of case studies. The course is designed to develop practical professional skills for application in the international arena.

PUBPOL 249: Statistics for Program Evaluation
CCN: 29179
Time: TU, TH 10:00 am - 11:29 am GSPP 105
Instructor: Avi I Feller
Units:4

How do we know whether a program or policy is having its intended impact? This course will cover the methods used to answer this question. The focus will be on quantitative studies, with an emphasis on the econometric techniques used in experimental and non-experimental evaluations. We will also discuss the role of program evaluations in policy analysis and design and the limits to program evaluation as a tool for policy improvement. Examples will be drawn from real-life social policy interventions in domestic and international settings.

Module 3:

Development Technologies (contextualized technologies, sensors, data collection, data mining, analysis)

Energy and Resources C200: Energy and Society **
Class #:26706
Daniel M Kammen
Time: TU, TH 8:00 am - 9:29 am Wheeler 150
Units:4
Instructor: Daniel Kammen

Energy sources, uses, and impacts; an introduction to the technology, politics, economics, and environmental effects of energy in contemporary society. Energy and well-being; energy international perspective, origins, and character of energy crisis.

Civil & Environmental Eng 210: Water Pathogens**
CCN: 30720
Time: NOT OFFERED IN FALL 2019
Instructor: Kara Nelson

Comprehensive strategies for the assessment and control of water-related human pathogens (disease-causing microorganisms). Transmission routes and life cycles of common and emerging organisms, conventional and new detection methods (based on molecular techniques), human and animal sources, fate and transport in the environment, treatment and disinfection, appropriate technology, regulatory approaches, water reuse.

CIVENG 211A 001: Environmental Physical-Chemical Processes**
Class #:27442
TU, TH 2:00 pm - 3:29 pm Davis 534
Instructor: Kara L Nelson
Units:3

Fundamental concepts of physical-chemical processes that affect water quality in natural and engineered environmental systems. Focus is on developing a qualitative understanding of mechanisms as well as quantitative tools to describe, predict, and control the behavior of physical-chemical processes. Topics include reactor hydraulics and reaction kinetics, gas transfer, adsorption, particle characteristics, flocculation, gravitational separations, filtration, membranes, and disinfection

ESPM 217 001 - LEC 001 Political Economy of Climate Change**
Class #:27088
W 3:00 pm - 5:59 pm
Instructor: Jonas Meckling
Units:3

This course examines the comparative and global political economy of climate change, with a focus on the politics of climate change mitigation in the energy sector. Key themes are the choice of policy strategies and policy instruments, industry and climate policy, global institutions and collective action, markets and technological change, and economic and geo-political transformations in response to climate change. The courses combines theoretical readings with in-depth case studies.

Energy and Resources C221: Climate, Energy, and Development **
Class #:27140
Time: TH 2:00 pm - 4:59 pm Kroeber 238
Units:3
Instructor: David Roland-Holst

Graduate seminar examining the role of energy science, technology, and policy in international development. The course will look at how changes in the theory and practice of energy systems and of international development have co-evolved over the past half- century, and what opportunities exist going forward. A focus will be on rural and decentralized energy use, and the issues of technology, culture, and politics that are raised by both current trajectories, and potential alternative energy choices. We will explore the frequently divergent ideas about energy and development that have emerged from civil society, academia, multinational development agencies, and the private and industrial sector.

ESPM 261 Sustainability and Society**
CCN: 27095
Time: TBD
Instructor: TBD

Science-based technologies that are central to the search for sustainability in contemporary societies and their environmental impacts. Theoretical approaches to investigating how science, technology, and environment intersect. How societies move closer to sustainable technological systems. Redesign of existing technologies and the introduction of new technologies. How adverse impacts can be prevented through policy. Case studies of contemporary developments.

Civil & Environmental Engineering 271: Sensors and Signal Interpretation**
Class #:27423
TU, TH, 2:00 pm - 3:29 pm, Davis 544
Instructor: Steven Glaser
Units: 3

An introduction to the fundamentals of sensor usage and signal processing, and their application to civil systems. In particular, the course focuses on how basic classes of sensors work, and how to go about choosing the best of the new MEMS-based devices for an application. The interpretation of the data focuses on analysis of transient signals, an area typically ignored in traditional signal processing courses. Goals include

development of a critical understanding of the assumptions used in common sensing and analysis methods and their implications, strengths, and limitations.

Computer Science 289A: Introduction to Machine Learning
CCN: 27717
Jennifer Listgarten, Stella Xingxing Yu
M, W, F, 3:00 pm - 3:59 pm, TBD
Units: 4

This course provides an introduction to theoretical foundations, algorithms, and methodologies for machine learning, emphasizing the role of probability and optimization and exploring a variety of real-world applications. Students are expected to have a solid foundation in calculus and linear algebra as well as exposure to the basic tools of logic and probability, and should be familiar with at least one modern, high-level programming language.