DEVELOPMENT ENGINEERING + InFEWS Innovation at the Nexus of Food Energy and Water Systems

Designated Emphasis in Development Engineering and InFEWS

Fall 2018 Course Offerings

** denotes classes that might be interesting for InFEWS

Core Courses (req'd for both DevEng & InFEWS)

DevEng C200: Design, Evaluate and Scale Development Technologies (3 units)
CCN: 27275
Time: Mondays 6-9:30pm, TBD
Instructors: Ashok Gadgil, Jennifer Walske

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

Module 1: Problem Identification and Project Design

- **(New Course) Development Engineering 215: Global Poverty: Challenges and Hopes in the New Millennium**
  CCN: TBD
  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.

- **Development Practice C232: Foundations of Public Health**
  CCN: 26234
  Time: Tu 9 – 11 AM, Wellman 311
  Instructor: Art 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: MW 2:00pm - 3:29pm South Hall 205
  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.

- **Information 213: User Interface Design and Development**
  CCN: 28669
  Time: TBD
  Instructor: TBD

  User interface design and human-computer interaction. Examination of alternative design. Tools and methods for design and development. Human computer interaction. Methods for measuring and evaluating interface quality.

Module 2: Evaluation Techniques and Methods for Measuring Social Impact

- **Development Practice 222: Economics of Sustainable Resource Development****
  CCN: 26232
  Time: M W 2 – 3:30, Wellman 311
  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: 26233
  Time: Th 3 – 5, Wellman 311
  Instructor: TBD

  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: 21192
  Time: MW 10:00am - 11:59am Etcheverry 3106
  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: 21204
  Time: TTh 4:00pm - 5:59pm Evans 639, W 10:00am - 11:59am
  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: 21198
  Time: M 4 – 6, Evans 648
  Instructor: Edward Miguel

- **Information 272: Qualitative Research Methods for Information Systems and Management**
  CCN: 32552

Time: MW 2:00pm - 3:29pm South Hall 205
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: 26694
  Time: TTh 11:00am - 12:29pm Valley Life Sciences 2040
  Instructor: David Anthoff

  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: 28893
  Time: F 2:00pm - 4:59pm Genetics & Plant Bio 103
  Instructor: Jack Colford

  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: 28587
  Time: W 10:00am - 11:59am Cory 241
  Instructor: Alain de Janvry

  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.

Module 3: Development Technologies (contextualized technologies, sensors, data collection, data mining, analysis)

- **Civil & Environmental Eng 210: Water Pathogens****
  CCN: 30720
  Time: TTh 12:30pm - 1:59pm - Davis 502
  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.

- **Civil & Environmental Engineering 271: Sensors and Signal Interpretation****
  CCN: 26962
  Time: Tu Th 12:30 – 2, Davis 544
  Instructor: Steven Glaser

  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: 27268
  Time: TTh 9:30am - 10:59am - Li Ka Shing 245
  Instructor: Benjamin Recht and Moritz Hardt

  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.

- **Energy and Resources C200: Energy and Society** **
  CCN: 26255
  Time: TTh 2:00pm - 3:29pm - Haas Faculty Wing F295
  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.

- **Energy and Resources C221: Energy, Climate, and Development** **
  CCN: 26728
  Time: M 10 – 1, Wellman 311
  Instructor: TBD

  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: 26682
  Time: W 10-12
  Instructor: Alastair Iles

  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.