1. Development Engineering 210: Development Engineering Research and Practice Seminar
   CCN: 18503
   Time: W 12-2P, 210 JACOBS
   Instructor: AGOGINO, A M

   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 each spring term, will focus on work-in-progress presentations by the students, as well as faculty and guest lecturers. This seminar is a required course for the Designated Emphasis in Development Engineering.

   CCN: 27126
   Time: TBA
   Instructor: SHEWCHUK, J

   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.
3. Civil and Environmental Engineering 210A: Control of Water-Related Pathogens
CCN: 14872
Time: TuTh 11-1230P, 544 DAVIS
Instructor: NELSON, K L

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.

4. Civil and Environmental Engineering 209: Design for Sustainable Communities
CCN: 14869
Time: Tu 330-430P, B100 BLUM
Instructor: GADGIL, A

The course provides conceptual and hands-on experience developing sustainable and scalable solutions to alleviate poverty and address basic human needs. Students work on interdisciplinary teams and partner with an outside client working to achieve positive sustained impact in a resource constrained community. Students and their client define a design challenge currently facing the organization and each team commits to produce a set of deliverables that respond to the challenge. Hands-on work is complemented by mini-lectures and short workshops as well as case studies of ongoing projects. In the past, students have joined the course from a variety of backgrounds, including engineering, business, public policy, ERG, physics, architecture, and public health, among others.

CCN: 18506
Time: MWF 3-4, 330 BLUM
Instructor: Jastram, Kate, MA, JD

As a Development Engineering Special Topics Course, this course will examine the challenges facing Syrian refugees from a variety of perspectives, asking questions about international law, State responsibility, the role of development, the role of information technologies in the unfolding crisis, and the impact of gender and age on the protection needs of the refugees.

CCN: 18603
Time: W 1-3P, 311 WELLMAN
Instructor: ZILBERMAN, D

This course will introduce the basic concepts of innovation, product development, and marketing in developing countries. Students will analyze alternative knowledge and innovation systems, and the role of public and private sector interactions. The course will also introduce models of technology transfers, adoption, and diffusion of technology, as well as introduce students to basic principles of marketing, assessment of consumer choices, and the challenge of bringing to market efficient solutions to meet customer needs.
   CCN: 22844  
   Time: F 9-12P, 597 EVANS  
   Instructor: TAUBINSKY, D

This course explores ways to formally model the findings of psychological, experimental-economic, and other research demonstrating departures from perfect rationality, self interest, and other classical assumptions of economics. The fundamental point of studying this material is to improve positive and normative economics, and topics for this course (and for my research) are chosen with that goal very much in mind. Yet the course will focus a little on the behavioral evidence itself and mostly on formalizing assumptions reflecting this evidence in a way that can be used by economists, not on the economic applications themselves. Economics 219B, taught in the spring, builds from and complements this course, and places greater emphasis on both economic applications and on empirical methods.

8. **Economics 240B: Econometrics**
   CCN: 22870  
   Time: MW 10-12P, 648 EVANS  
   Instructor: POWELL, J L

This is the second semester of the core sequence in econometrics (a.k.a. quantitative methods), which develops the procedures used for empirical implementation and validation of economic relationships.

9. **Economics 270B: Development Economics**
   CCN: 22884  
   Time: M 2-4P, 597 EVANS  
   Instructor: FINAN, F S

This course covers leading research issues in Development Economics, with a particular focus on macroeconomic growth empirics, political economy, and human capital topics. It is taught at a level appropriate for Ph.D. students in Economics and related fields.

10. **Economics 274: Global Poverty and Impact Evaluation**
    CCN: 22890  
    Time: TuTh 930-11A, 105 NORTH GATE  
    Instructor: FINAN, F S

Rather than simply describing the causes and symptoms of global poverty, this course will explore the variety of tools available for rigorously measuring the impact of development programs. Through weekly case studies of field research, the course will cover impact evaluation theory and methods. The course will culminate with a final project in which each student will design an impact evaluation of a policy or intervention.

11. **Energy and Resources Group C271: Energy and Development**
    CCN: 27606  
    Time: M 2-5P, 186 BARROWS  
    Instructor: KAMMEN, D
This graduate seminar will examine the theoretical frames and models used to examine the linkages between energy and development, and the impacts of one on the other. Some interdisciplinary course background is essential. Students will be expected to draw from tools taught in prerequisite courses that cover topics including resource and sustainability science, dynamical modeling, political economy, and other fields.

**12. Energy and Resources Group 275: Water and Development**

CCN: 27607  
Time: TuTh 1230-2P, 220 WHEELER  
Instructor: RAY, I

Introduction to water policy in developing countries. It is a course motivated by the fact that over one billion people in developing countries have no access to safe drinking water, three billion do not have sanitation facilities, and many millions of small farmers do not have reliable water supplies to ensure a healthy crop. Readings and discussions will cover: the problems of water access and use in developing countries; the potential for technological, social, and economic solutions to these problems; the role of institutions in access to water and sanitation; and the pitfalls of the assumptions behind some of today's popular "solutions."

**13. Information 214: Needs and Usability Assessment**

CCN: 41581  
Time: Th 330-630P, 202 SOUTH HALL  
Instructor: FADDEN, S P

This course addresses concepts and methods of user experience research. The emphasis will be on methods of collecting and interpreting many kinds of data about real-world user activities and practices and translating them into design decisions. The course includes hands-on practice with a number of major user experience research methods, including heuristic evaluation; observation; interviews, surveys and focus groups. The emphasis will be on naturalistic/ethnographic (qualitative) methods, but we will also address major quantitative methods. Finally, we will discuss methods of bringing user experience research into the design process.