

**Arch140 – Intro to Energy and Environmental Management (Benton, Brager)** S08, TuTh 11-1230. Thermal and lighting environments in buildings, emphasis on quantitative design techniques.

**Arch240 – Energy Analysis Tools for Sustainable Building Design (Huizenga)** S08, TuTh 930-11. Quantitative and qualitative methods for assessing energy performance of residential and commercial buildings. Students will get hands-on experience with various state-of-the-art software.

**BioEngC105B/ME105B – Thermodynamics and Biothermodynamics** F?. Introduces basic principles of thermodynamics and application to a variety of biological processes and systems.

**ChemE295F – Battery Technologies (Gur, Srinivasan)** Course aims to equip students with the concepts and analytical skills necessary to assess the utility and viability of various battery technologies in the context of a growing demand for electrochemical energy storage.

**CE107 – Climate-Change Mitigation (Nazaroff)** S08, MWF 9-10. Assessment of technological options for responding to the threat of climate change. Overview of climate science. Renewable energy, transport, storage, and transformation technologies, efficiency, sequestration.

**CE170 – Energy, Ecosystems, and Humans (Patzek)** Study the relationships between ecosystems (ancient and new), their energy storage and throughput, energy production and its side effects.

**CE 198 Petroleum Industry Fundamentals (Patzek)** A series of one-week units covering the history and technical aspects of the industry

**CE218A – Air Quality Engineering (Harley, Nazaroff)** Quantitative overview of the characterization and control of air pollution problems. Key elements: sources and control techniques, atmospheric transport and transformation, and air quality modeling.

**CE268E – Civil Systems and the Environment (Horvath)** Methods and tools for economic and environmental analysis. Life-cycle planning, design, costing, financing, and environmental assessment. Industrial ecology, design for environment, pollution prevention.

**CE290 – Petroleum Capstone Design (Cooper, Patzek)** The process of discovering and evaluating an oilfield. Covers seismic survey, design, drilling, and completing a discovery well; logging, testing, delineation of the reservoir, estimation of reserves, production planning, and economic analysis.

**CE C293A/ER293A Technology and Sustainability (Horvath, Gadgil)** Consequences and opportunities of technological systems (e.g. buildings, waste mgmt., etc.) for sustainability.

**CRP C213/CE C290U – Transportation & Land Use Planning (Cervero)** Builds a conceptual and methodological framework for transportation and land use planning. First half focuses on demand, supply, cost, and performance of transport systems, second on empirical analysis.

**CRP 298 004 — Cities and Climate Change: The Local Government Role in Greenhouse Gas Emissions Reduction.** S08, M 6-8 (first 12 weeks of semester) Climate change mitigation will likely require changed settlement and transportation patterns. City planners, transportation engineers, and other local policymakers may be best positioned to effect such change. This course is designed to inform that work.

**CRP 298 005 — Pedestrian and Bicycle Transportation** S08 5-7. Pedestrian and Bicycle transportation planning links issues of mobility, access, air quality, global warming, and public health. This course will include practical methods of establishing community-wide networks, designing facilities, improving safety, estimating demand, and more. The course will include lectures, guest speakers, field trips, and one class project.

**ER100 – Energy & Society (Kammen)** F08. Analytic tools for the study of the science, engineering, and policy questions of energy technologies, applications, and impacts. Pre-requisite to work in RAEL, and for some advanced energy courses. Graduate students must enroll in ER200N.

**ER151 – Politics of Energy and Environmental Policy** F08. Covers how existing agencies and policy makers incorporate new concerns into their tasks, and how agencies given new mandates seek to fold them into the existing institutional and policy structures.

**ER199 — Applications of Energy Efficiency and Conservation** S08, M 11-1. Learn how to conduct energy audits, analyze building energy consumption in workshops given by professionals, create an energy plan for a campus building and learn essential skills such as grant writing, proposal writing, and consulting

**ER200N – Energy & Society (Kammen)** See ER100 description. For graduate students only. Undergraduates must enroll in ER100.

**ER220 – Modeling for Energy and Resources (Farrell)** Next offered: Fall 08 (alternate years). Optimization modeling and decision analysis with an emphasis on optimization and on applications in energy, environment, and resource management.

**ER226/MSE226 – Photovoltaic Materials (Kammen)** Next offered: F08 (alternate years). Advanced treatment of the solid state physics, performance, market economics and regulatory policies surrounding the development, implementation, and uses of photovoltaics.

**ER254 – Electric Power Systems (Farrell)** (alternate years) S08 TuTh 1230-2. Introduces the design and operation of electric power systems. Covers the physics of electricity, reactive and three-phase power, circuit analysis, reliability, system planning, scheduling, industrial organization and regulation.

**ER280 – Energy Economics (Norgaard)** S08 TuTh 2-3:30. Explores input-output and cost benefit analysis applied to energy; exhaustion theory and economics of energy supply; patterns of energy use; trade-offs in energy conservation; the effect of energy policy on supply and demand; projecting future energy and resource supply and use..

**ER290 – Energy and Development (Kammen)** Next offered: F08 (alternate years). Seminar that focuses on the relationship between development theories and practice, and decisions about energy resources and technologies. Focus on rural and decentralized energy.

**ER290-001 – Climate Change Impacts and Adaptation (Torn)** The course will emphasize the consequences of climate change and actions to minimize its impacts.

**ER291-001 – Transportation Energy (Farrell)** Next offered: Spr09 (alternate years). Seminar provides an overview of technical and social issues that are important to the supply and demand for transportation energy in the United States.

**ER291-002 – Climate Change Policy (Farrell)** Next offered: Spr09 (alternate years). Seminar on the history, objectives, institutions, structure, and politics of policies for climate change.

**ER291-003 – Design for Sustainable Communities (Gadgil)** S08 10-12. Teams of four students each will take on practical projects, with guidance from subject experts, to help mature technical/scientific innovations into useful products or processes.

**ER291-004 – End-Use Energy Efficiency (Sanstad)** Seminar introduction to end-use energy efficiency in its engineering, economic, and policy aspects, and some more in-depth topics.

**ER299 – Cal Climate Action Partnership Seminar (Kammen)** Students will identify, study, and initiate greenhouse gas reduction projects on campus through action-oriented research.

**ESPM102D – Resource and Environmental Policy (Romm)** Develops concepts of public policy and how cultural, legal, political, economic, and administrative processes form, execute, and modify it.

**ESPM129 – Biometeorology (Baldocchi)** Examines physical, biological, and chemical processes affecting transfer of momentum, energy, and material (water, CO<sub>2</sub>, trace gases) between vegetation and the atmosphere.

**ESPM 256 — Science, Technology and the Politics of Nature.** S08 W 2-5. (Winickoff) This graduate seminar will introduce the methods and theories of Science and Technology Studies (STS) in order to explore the relationship of science, technology, law and politics in the domains of environment, development, energy, and biomedicine. The course will focus some attention on the tension between technocracy and democracy in science policy.

**ESPM 298.xx — Climate Change: the Science Behind Solutions. (Silver)** S08 W 2-4. Explore, in depth, the scientific merits of controversial mitigation strategies, including alternative energy, carbon trading, carbon sequestration, and geoengineering.

**IAS 175 – The Economics of Climate Change (Auffhammer, Fisher)** Brief intro to scientific aspects. Economic models to analyze the impacts of climate change and provide and critique existing and proposed policy tools.

**LAW270.6 – Energy Regulations & the Environment (Weissman)** S08, Th 3:20-6. Examines both traditional monopoly model of electricity regulation and evolving competitive alternatives. Covers energy resource planning, pollution, rate design, efficiency, demand management, renewable energy.

**LAW272.3 – Climate Change: Law and Policy (Payne, Farber, Frank)** The course addresses the key state, national and international climate change policies, and the role of law in dealing with the classic issues of distributional justice, science, risk, uncertainty and precaution, federalism, technology policy, and international relations.

**LAW271.6 – Science & Regulatory Policy (Doremus)** S08, W 9-10:50. Seminar examining the role of science in regulatory decisionmaking, procedures for scientific input into the regulatory process, and mechanisms for oversight of the use of science in that process.

**LAW247 – Energy & Infrastructure Project Finance (Marks)** S08, Tu 1:55-4:35. This course will explore the key commercial, legal, economic and policy issues affecting the development and financing of energy projects, with special emphasis on practical concerns related to investments in alternative energy.

**LDArch103 – Energy, Fantasy, and Form (Sullivan)** This is an undergraduate studio with a central focus on climate modification for energy conservation. We will research historical precedents in order to develop new garden forms for passive green designs.

**MBA212 – Energy & Environmental Markets (Borenstein, Bushnell)** S08 11-1230. Business strategy and public policy issues in energy and environmental markets. Topics include development and effect of organized spot, futures, and derivative energy markets; political economy of regulation and deregulation; environmental policies; cartels, market power and competition policy.

**MBA290T/ENG298A/INFO290 – Energy, Sustainability, and Business Innovation (Rosen, Isaacs)** S08 T 4-6. Prepares students to assess commercial viability of new technologies, obtain venture capital and other funding for projects, position and market new energy solutions, identify business strategies, and develop productive relationships with industry, nonprofits, and government.

**MBA294.6 – Alternative Energy Speaker Series (Isaacs)** Covers traditional energy industries, as well as how innovations in alternative energy technologies are developing in response to global warming, energy dependence, and the geopolitical impact of hydrocarbon extraction.

**ME105 – Thermodynamics** This course introduces the basic principles of thermodynamics which are then applied to various areas of engineering related to energy conversion and air conditioning.

**ME140 – Combustion Processes (Chen)** Fundamentals of combustion, flame structure, flame speed, flammability, ignition, stirred reaction, kinetics and nonequilibrium processes, pollutant formation.

**ME146 – Energy Conversion Principles (Carey)** Covers the fundamental principles of energy conversion processes, followed by development of theoretical and computational tools that can be used to analyze energy conversion for both conventional and renewable energy.

**ME256 – Advanced Combustion (Dibble, Chen)** Numerical simulations of combustion. Combustion efficiency, minimization of pollutant formation. Catalytic combustion and catalyst based pollutant removal.

**ME290H – Green Product Development: Design for Sustainability (Agogino, Beckmann)** Covers the management of innovation processes for sustainable products, from product definition to sustainable manufacturing and financial models.

**NE225 – The Nuclear Fuel Cycle (Ahn)** Covers the nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal, emphasizing environmental impacts.

**PP190-8/PP290-8 – Environment and Technology from the Policy and Business Perspective (Taylor)** Introduces environmental strategies that are being used by both policy-makers and business to affect technology development and adoption today.

#### *Non-Course Offerings*

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The **Energy and Resources Group (ERG)** holds colloquia on Wednesdays at 4-5:30 in Barrows Hall. See <http://socrates.berkeley.edu/erg/colloquim/> for details.

The **Renewable and Appropriate Energy Laboratory (RAEL)** holds weekly lunch talks on Wednesdays, 12:00 – 1:00 PM, 4152 Etcheverry Hall. See <http://socrates.berkeley.edu/~rael>

The **University of California Energy Institute (UCEI)** holds occasional seminars on various topics <http://www.ucei.berkeley.edu/>

The **Environmental Energy Technologies Division** of the Lawrence Berkeley National Laboratory holds occasional brown bag lunch seminars <http://eetd.lbl.gov/Seminars.html>

The **Department of Nuclear Engineering** holds weekly seminars on Monday afternoon, <http://www.nuc.berkeley.edu/colloquiums/index.htm>

The **Joint Center for Transportation Sustainability Research** will hold a biofuels seminar in the fall each Monday from 4-5 in 310 Barrows. <http://www.its.berkeley.edu/sustainabilitycenter/>

The **Department of Agricultural and Resource Economics** holds seminars at noon on Wednesday [http://are.berkeley.edu/courses/envres\\_seminar/](http://are.berkeley.edu/courses/envres_seminar/)

The **Berkeley Energy & Resources Collaborative** holds various events <http://groups.haas.berkeley.edu/herc>

Undergraduates can **minor in energy and resources** [http://socrates.berkeley.edu/erg/info/undergraduate\\_minor.shtml](http://socrates.berkeley.edu/erg/info/undergraduate_minor.shtml)

Ph.D. students can earn **Designated Emphasis in Energy Science and Technology**.

#### *Professional experience*

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ERG manages an **internship** program where graduate students can work on a wide range of energy, natural resources, telecommunications and water resource projects at the **California Public Utilities Commission** (based in San Francisco). Support ranges from a few hours/week to 50% GRS jobs (plus tuition at >25%).