Energy and Resources

The Energy and Resources Group (ERG) is an interdisciplinary academic unit of UC Berkeley, conducting programs of graduate teaching and research that treat issues of energy, resources, development, human and biological diversity, environmental justice, governance, global climate change, and new approaches to thinking about economics and consumption. Established in 1973, ERG offers two-year MA and MS degrees in Energy and Resources, as well as a PhD.

The graduate courses in ERG provide advanced training in interdisciplinary analysis and research. Individual courses review current developments in the field or emphasize particular disciplinary perspectives: economics, resources, politics, public policy, or environmental sciences.

The purpose of the ERG Master's program is to educate the next generation of interdisciplinary leaders. Specifically, students are taught the range of methods and subjects they should be able to understand, advance, and critique to address critical issues stemming from the interaction of humans and the environment. To that end, the requirements for the ERG Master's degree are both broad and deep, stressing analytic, methodological, theoretical, and practical approaches to problems in energy, resources, and the environment.

There are approximately 60 graduate students enrolled in ERG degree programs, about half of them doctoral candidates. The students come from a wide variety of backgrounds—engineering, natural sciences, social sciences, and humanities. The characteristics they have in common are an interest in interdisciplinary approaches to energy and resource issues and the intellectual credentials to succeed in a rigorous academic program. All receive training at ERG in the technological, environmental, economic, and sociopolitical dimensions of energy and resource issues while pursuing additional coursework and individual research tailored to their interest and backgrounds.

Admission to the University

Uniform minimum requirements for admission

The following minimum requirements apply to all programs and will be verified by the Graduate Division:

1. A bachelor's degree or recognized equivalent from an accredited institution;
2. A minimum grade-point average of B or better (3.0);
3. If the applicant comes from a country or political entity (e.g. Quebec) where English is not the official language, adequate proficiency in English to do graduate work, as evidenced by a TOEFL score of at least 570 on the paper-and-pencil test, 230 on the computer-based test, 90 on the iBT test, or an IELTS Band score of at least 7 (note that individual programs may set higher levels for any of these); and
4. Enough undergraduate training to do graduate work in the given field.

Applicants who already hold a graduate degree

The Graduate Council views academic degrees as evidence of broad research training, not as vocational training certificates; therefore, applicants who already have academic graduate degrees should be able to take up new subject matter on a serious level without undertaking a graduate program, unless the fields are completely dissimilar.

Programs may consider students for an additional academic master's or professional master's degree if the additional degree is in a distinctly different field.

Applicants admitted to a doctoral program that requires a master's degree to be earned at Berkeley as a prerequisite (even though the applicant already has a master's degree from another institution in the same or a closely allied field of study) will be permitted to undertake the second master's degree, despite the overlap in field.

The Graduate Division will admit students for a second doctoral degree only if they meet the following guidelines:

1. Applicants with doctoral degrees may be admitted for an additional doctoral degree only if that degree program is in a general area of knowledge distinctly different from the field in which they earned their original degree. For example, a physics PhD could be admitted to a doctoral degree program in music or history; however, a student with a doctoral degree in mathematics would not be permitted to add a PhD in statistics.
2. Applicants who hold the PhD degree may be admitted to a professional doctorate or professional master's degree program if there is no duplication of training involved.

Applicants may only apply to one single degree program or one concurrent degree program per admission cycle.

Any applicant who was previously registered at Berkeley as a graduate student, no matter how briefly, must apply for readmission, not admission, even if the new application is to a different program.

Required documents for admissions applications

1. **Transcripts:** Upload unofficial transcripts with the application for the departmental initial review. Official transcripts of all college-level work will be required **if admitted**. Official transcripts must be in sealed envelopes as issued by the school(s) you have attended. Request a current transcript from every post-secondary school that you have attended, including community colleges, summer sessions, and extension programs.
   If you have attended Berkeley, upload unofficial transcript with the application for the departmental initial review. Official transcript with evidence of degree conferral ***will not*** be required if admitted.
2. **Letters of recommendation:** Applicants can request online letters of recommendation through the online application system. Hard copies of recommendation letters must be sent directly to the program, not the Graduate Division.
3. **Evidence of English language proficiency:** All applicants from countries in which the official language is not English are required to submit official evidence of English language proficiency. This requirement applies to applicants from Bangladesh, Burma, Nepal, India, Pakistan, Latin America, the Middle East, the People's Republic of China, Taiwan, Japan, Korea, Southeast Asia, and most European countries. However, applicants who, at the time of application, have already completed at least one year of full-time academic course work with grades of B or better at a U.S. university may submit an official transcript from the U.S. university to fulfill this requirement. The following courses will not fulfill this requirement: 1) courses in English as a Second Language, 2) courses conducted in a language other than English, 3) courses that will be completed

after the application is submitted, and 4) courses of a non-academic nature. If applicants have previously been denied admission to Berkeley on the basis of their English language proficiency, they must submit new test scores that meet the current minimum from one of the standardized tests.

Admission to the Program

The Energy and Resources Group seeks students who have excelled academically, whatever their discipline; who show promise of ability to cross disciplinary boundaries; and who want not only to understand problems of energy, resources, and environment but to help solve them.

ERG deliberately admits students with a wide variety of interests, perspectives, disciplines, research methods, and experience so that each can help the others see the whole picture.

Admission to ERG is highly competitive, with a class of 20 students (Master's and Ph.D. combined) selected annually from approximately 250 applicants.

Those admitted to the program have strong academic records and letters of recommendation, balanced and strong GRE scores, and, where applicable, related work experience and publications. The statement of purpose, supplemented by the personal history statement, is vital in demonstrating an applicant's commitment to the program.

You may apply to the two-year Master's Degree (MS or MA), ERG/Public Policy Concurrent Master's Degree or the PhD program. Within the Master's applications there is checkbox to indicate your interest in the Master's/Ph.D. Track.

Admission to the Master's Program, MA or MS

The minimum requirement for admission to the Master's Degree program is completion of a Bachelor's degree or its equivalent at a fully accredited U.S. institution of higher learning or foreign equivalent. Because the program is fundamentally interdisciplinary, there are no other formal requirements for consideration, although, as discussed above, successful candidates will demonstrate academic and intellectual excellence.

Admission to the Master's/PhD Track

A small number of highly qualified applicants will be selected for the Master's/PhD Track. The Track is both an indication of your intent to continue to the PhD program at ERG, and ERG's expectation that you will to be qualified to continue to doctoral work after satisfying the Master's Degree requirements. It does not obligate you, or ERG, to your eventual matriculation to the PhD. Candidates admitted into the joint Master's/PhD track will be expected to complete all the requirements of the ERG Master's Degree before continuing. Candidates for admission to the Master's program whose ultimate goal is to continue on for a PhD at ERG should select either the MA or MS degree application and select the Master/s PhD. Track checkbox. Other Master's students may apply to the PhD program upon successful completion of the two-year Master's program.

Admission to the PhD Program

Students admitted directly to the PhD program must have a two-year Master's Degree from a fully accredited U.S. institution of higher learning or foreign equivalent. They also must be able to demonstrate a highly interdisciplinary academic background, either through a combination of Bachelor's and Master's degree coursework, or an interdisciplinary Master's program equivalent in breadth and depth to the ERG Master's program. Doctoral students must also demonstrate their readiness for independent research with no additional foundational work required. Applications from students with one-year Master's degrees, or with single-discipline professional degrees (e.g., law, public health) will usually be redirected to the ERG Master's program for consideration.

Recommended Preparation

We highly recommend at least one term of college-level calculus and courses in fundamental science (physics, chemistry, biology, etc.), as well as four or more upper-division social science (political science, sociology, anthropology, etc.) and humanities courses.

Application Process

1. **Statement of Purpose and Personal History Statement:** ERG requires two essays and places considerable weight on them: the Statement of Purpose and the Personal History Statement. Each statement should be no longer than three pages (double spaced, 10–12 pt. font).
   - **The Statement of Purpose** should discuss your motivations for wanting to enter a graduate degree program, and specifically why you would like to study at ERG. This is an open-ended opportunity for you to tell us how you envision this degree furthering your plans and dreams for the future. We are not looking for a summary of your dissertation topic or Master's focus, but a general statement of how this program fits into your goals.
   - **The Personal History Statement** should not be a narrative summary of your CV, but a more introspective look what has brought you to this point of wanting to pursue a degree at ERG. It can be a place to share formative experiences, inspiring influences, or personal challenges.
2. **Transcripts:** Unofficial copies of your transcripts will be accepted for the application. If you are admitted, you will be required to submit official transcripts for all college-level work. For coursework completed in the fall term of your admissions cycle, ERG will accept amended transcripts and late grade reports until the first Friday in January. There is a section of the application that will allow you to document coursework in progress.
3. **Letters of Recommendation:** ERG requires three letters of recommendation, and will accept up to five. You are welcome to use recommenders from your professional as well as your academic career. At least one letter must be from a professor who is in a position to assess your potential for advanced academic work. It is strongly preferred that your recommenders use the UC Berkeley online portal to upload letters to your application. On your application, you will find a section that asks you for name and email address for your recommenders. When you submit that information, the system will automatically send an email request to your recommenders with a link where they can upload their recommendation letter as a PDF. You should review your application periodically to see if the letters from your recommenders have been uploaded. You will have the option to electronically send a reminder request. If a recommender is unable or unwilling to upload a letter electronically, we will accept hard copies mailed in a sealed envelope (with signature over the seal) to: CONFIDENTIAL Admissions, Energy & Resources Group, 310 Barrows Hall #3050, Berkeley, CA 94720–3050. We will then upload the letter to your file for them.
4. **GRE scores:** All applicants are required to submit GRE scores. International applicant GRE scores will be viewed with an understanding of the challenges of taking this test in a second language.

ETS transmits scores to UC Berkeley directly, but you may self-report scores until we are able to verify your official score. To submit your official score, on your test registration list the Berkeley Graduate Division institutional code **4833.** You do not need a department code. We recommend taking the GRE no later than October. To be valid, the GRE must have been taken within the past 5 years.

5. **Language Proficiency Scores:** International applicants from countries in which the official language is not English must provide official evidence of English proficiency. There are two standardized tests you may take: the Test of English as a Foreign Language (TOEFL), and the International English Language Testing System (IELTS). To submit your TOEFL score, on your test registration please list the institution code for Berkeley, 4833. You do not need a department code. Scores more than two years old will not be accepted. For more information about language testing and scores, as well as applicants from which countries will be required to submit scores, please refer to the Graduate Division website.

Curriculum

ENE,RES 201	Interdisciplinary Analysis in Energy and Resources	3
ENE,RES 292C	Master's Project Seminar	2
ENE,RES 292D	Master's Project Seminar	2
ENE,RES 295	Special Topics in Energy and Resources (two semesters)	1
ENE,RES 299	Individual Research in Energy and Resources	1-12
Select one elective from one of the following specialized topic areas: Interdisciplinary energy and resource analysis; environmental science; resource and environmental economics; social science approaches to energy, resources, and the environment; engineering approaches to energy; or resources and the environment		
Elective cluster: Three courses, as per approved study list relating to student's research subject area		
Electives, as per approved study list		

Curriculum

Courses Required

ENE,RES 201	Interdisciplinary Analysis in Energy and Resources	4
ENE,RES 292C/ ENE.RES 292D	Master's Project Seminar	4
ENE,RES 295	Special Topics in Energy and Resources (two semesters)	1
ENE,RES 299	Individual Research in Energy and Resources	1-12
Select an elective (1) from the following specialized topic areas: interdisciplinary energy & resource analaysis; environmental science; resource & environmental economics; social science approaches to energy, resources, & the environment, engineering approaches to energy, resources & the environment		
Elective cluster (3) per approved study list relating to student's research subject area		
Electives per approved study list		

Differentiation of degree is based on the substantive content of coursework and Master's project

Energy and Resources

ENE,RES C200 Energy and Society 4 Units
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.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Kammen

Also listed as: PUB POL C284

ENE,RES 201 Interdisciplinary Analysis in Energy and Resources 3 Units
Introduction to interdisciplinary analysis as it is practiced in the ERG. Most of the course consists of important perspectives on energy and resource issues, introduced through a particularly influential book or set of papers. The course also provides an introduction to the current research activities of the ERG faculty as well as practical knowledge and skills necessary to successfully complete graduate school in an interdisciplinary program.
Rules & Requirements

Prerequisites: Open to ERG graduate students only or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructors: Harte, Kammen, Ray

ENE,RES C202 Modeling Ecological and Meteorological Phenomena 3 Units
Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. Offered alternate years.
Rules & Requirements

Prerequisites: Integrative Biology 102 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Harte

Also listed as: ESPM C211

ENE,RES C205 Quantitative Methods for Ecological and Environmental Modeling 3 Units
This course will review the background mathematical and statistical tools necessary for students interested in pursuing ecological and environmental modeling. Topics include linear algebra; difference equation, ordinary differential equation, and partial differential equation models; stochastic processes; parameter estimation; and a number of statistical techniques. This course will be recommended as a prerequisite for advanced modeling courses in Integrative Biology, Energy and Resources Group, and Environmental Science, Policy, and Management.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Also listed as: ESPM C205/INTEGBI C205

ENE,RES C221 Climate, Energy and Development 3 Units
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.
Rules & Requirements

Prerequisites: Graduate student standing or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Kammen

Also listed as: DEVP C221/PUB POL C221

ENE,RES C226 Photovoltaic Materials; Modern Technologies in the Context of a Growing Renewable Energy Market 3 Units
This technical course focuses on the fundamentals of photovoltaic energy conversion with respect to the physical principals of operation and design of efficient semiconductor solar cell devices. This course aims to equip students with the concepts and analytical skills necessary to assess the utility and viability of various modern photovoltaic technologies in the context of a growing global renewable energy market.
Rules & Requirements

Prerequisites: Material Science and Mineral Engineering 111 or 123 or equivalent. Should have a firm foundation in electronic and optical props of semiconductors and basic semiconductor device physics

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Also listed as: MAT SCI C226

ENE,RES 254 Electric Power Systems 3 Units
Provides an understanding of concepts in the design and operation of electric power systems, including generation, transmission, and consumption. Covers basic electromechanical physics, reactive power, circuit and load analysis, reliability, planning, dispatch, organizational design, regulations, environment, end-use efficiency, and new technologies.
Rules & Requirements

Prerequisites: PHYSICS 7B or 8B or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

ENE,RES 270 Environmental Classics 3 Units
Motivation: What is the history and evolution of environmental thinking and writing? How have certain "environmental classics" shaped the way in which we think about nature, society, and development? This course will use a selection of 20th-century books and papers that have had a major impact on academic and wider public thinking about the environment and development to probe these issues. The selection includes works and commentaries related to these works that have influenced environmental politics and policy in the U.S. as well as in the developing world. Through the classics and their critiques, reviews, and commentaries, the class will explore the evolution of thought on these transforming ideas.
Rules & Requirements

Prerequisites: Graduate standing

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructors: Kammen, Ray

ENE,RES 273 Research Methods in Social Sciences 3 Units
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.
Rules & Requirements

Prerequisites: Graduate standing or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Ray

ENE,RES 275 Water and Development 4 Units
This class is an interdisciplinary graduate seminar for students of water policy in developing countries. It is not a seminar on theories and practices of development through the "lens" of water. Rather, it is a seminar motivated by the fact that over 1 billion people in developing countries have no access to safe drinking water, 3 billion don't 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 and assumptions behind some of today's popular "solutions."
Hours & Format

Fall and/or spring: 15 weeks - 4 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Ray

ENE,RES 280 Energy Economics 3 Units
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.
Rules & Requirements

Prerequisites: Economics 100A or equivalent; basic calculus or linear algebra

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: Norgaard

ENE,RES C283 Information and Communications Technology for Development 3 Units
This seminar reviews current literature and debates regarding Information and Communication Technologies and Development (ICTD). This is an interdisciplinary and practice-oriented field that draws on insights from economics, sociology, engineering, computer science, management, public health, etc.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructors: Ray, Saxenian

Also listed as: INFO C283

ENE,RES 290 Seminar in Energy and Resources 1 - 4 Units
Graduate student presentations and faculty-student discussions of advanced topics in energy and resources. Specific topics vary according to faculty and student interest.
Rules & Requirements

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2-3 hours of seminar and 0-1 hours of discussion per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

ENE,RES 291 Special Topics in Energy and Resources 1 - 3 Units
Study and critical analysis of advanced topics in energy and resources using interdisciplonary approaches. Specific topics vary according to faculty and student interest.
Rules & Requirements

Prerequisites: Graduate standing or consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-3 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

ENE,RES 292A Tools of the Trade 2 Units
Quantitative methods for energy and resource analysis. Topics include linear algebra, differential equations, statistical methods, chemical equilibrium theory, and thermodynamics.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

ENE,RES 292B Master's Project Seminar 2 Units
Required of second-semester Energy and Resources Master's candidates. Topics include the adoption of a research project, research design, presentation of work, and statistical analyses. Introduction to research skills, including Human Subject Research Protocols, research ethics and methodologies. Critical reading and analysis of research papers; development and discussion of project ideas. Students begin to identify and solicit faculty readers for their projects. Students will apply the interdisciplinary methods, approaches, and perspectives learned in the core curriculum.
Rules & Requirements

Prerequisites: Energy and Resources 201

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: ERG Faculty

ENE,RES 292C Master's Project Seminar 2 Units
Required for ERG Master's students in the semester previous to the one in which they plan to file their Project. Development of Master's Project outline and research plan. Identification and solicitation of faculty readers. Evaluation and integration of critical feedback from readers and cohort on project. Topics include the adoption of a research project, research design, presentation of work, and statistical analyses. Students will apply the interdisciplinary methods, approaches, and perspectives learned in the core curriculum. Course requirements include:
Attendance and active participation in the sharing and critique of the cohort's final master's projects (50%); draft project outline and final readers confirmed by end of term (50%).
Rules & Requirements

Prerequisites: Energy and Resources 201 and Energy and Resources 292B

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: ERG Faculty

ENE,RES 292D Master's Project Seminar 2 Units
Required of all ERG Master's students in the semester during which they plan to file their Final Master's Project. This course is intended to assist students in completing their required Master's Projects, and to provide constructive feedback to students on their Final Master's Project oral presentations. The goal is to improve the quality of the research for the ERG Master's Projects and to learn and refine presentation skills for an academic/professional audience.
Rules & Requirements

Prerequisites: Energy and Resources 201, 292B, and 292C

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

Instructor: ERG Faculty

ENE,RES 295 Special Topics in Energy and Resources 1 Unit
Presentations of research in energy issues by faculty, students, and visiting lecturers. Master's degree students required to enroll for three semesters.
Rules & Requirements

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of lecture per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

ENE,RES 296 Doctoral Seminar 2 Units
Lectures, reports, and discussions on current research in energy and resources. Particular emphasis on topics of research interest for current Ph.D. students in the Energy and Resources Group.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of independent study per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Formerly known as: 298

ENE,RES 298 Doctoral Seminar 2 Units
Lectures, reports, and discussions on current research in energy and resources. Sections are operated independently and under direction of different staff.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

ENE,RES 298N Directed Group Study 1 - 3 Units
Informal group studies of special problems in energy and resources.
Rules & Requirements

Prerequisites: Graduate standing and consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-3 hours of directed group study per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

ENE,RES 299 Individual Research in Energy and Resources 1 - 12 Units
Investigation of problems in energy and resources from an interdisciplinary perspective.
Rules & Requirements

Prerequisites: Graduate standing

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-12 hours of independent study per week

Additional Details

Subject/Course Level: Energy and Resources Group/Graduate

Grading: Letter grade.

ENE,RES 301 Graduate Student Instructor Practicum 3 Units
Course credit for experience gained in academic teaching through employment as a graduate student instructor.
Rules & Requirements

Prerequisites: Appointment as a graduate student instructor in the Group and permission of the graduate advisor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Energy and Resources Group/Professional course for teachers or prospective teachers

Grading: Offered for satisfactory/unsatisfactory grade only.