

# Agricultural and Resource Economics

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## Overview

The Department of Agricultural & Resource Economics focuses on applied economic and policy questions in agriculture, biotechnology, environment, natural resources, international development, and trade. Graduate students, faculty, and other affiliates conduct research in the following fields: agricultural economics and agribusiness; agricultural resource policy and political economy; applied econometrics; development; energy, environmental, and resource economics; intellectual property rights/biotechnology; and international economics and trade policy.

Faculty have received many awards for research and teaching, and they serve on editorial boards of journals, foundations, and other research institutes. For further information, please see Faculty Profiles (<https://are.berkeley.edu/people/faculty/>).

## Seminars

The department hosts a weekly Department Seminar and participates in other seminars on specialized topics. For information regarding these seminars, please click the links below:

Department Seminar (<https://are.berkeley.edu/events/>)  
Energy Institute at Haas (<http://ei.haas.berkeley.edu/>)

## Giannini Foundation

The Giannini Foundation of Agricultural Economics was founded in 1930 from a grant made by the Bancitaly Corporation to the University of California in tribute to its organizer and past president, Amadeo Peter Giannini of San Francisco. Members of the Giannini Foundation are University of California faculty and Cooperative Extension specialists in agricultural and resource economics on the Berkeley, Davis, and Riverside campuses. The broad mission of the Foundation is to promote and support research and outreach activities in agricultural economics and rural development relevant to California. For further information on the Foundation, please click here (<http://giannini.ucop.edu/>).

## Undergraduate Program

Environmental Economics and Policy (<http://guide.berkeley.edu/archive/2022-23/undergraduate/degree-programs/environmental-economics-policy/>): BA (College of Letters and Science), BS (College of Natural Resources)

## Graduate Program

Agricultural and Resource Economics (<http://guide.berkeley.edu/archive/2022-23/graduate/degree-programs/agricultural-resource-economics/>): PhD

## Agricultural and Resource Economics

Expand all course descriptions [+] Collapse all course descriptions [-]

## A,RESEC 201 Production, Industrial Organization, and Regulation in Agriculture 4 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Basic concepts of micro and welfare economics: partial and general equilibrium. Industrial organization: monopolistic competition, vertical integration, price discrimination, and economics of information with applications to food retailing, cooperatives, fishing, and energy. Production, Industrial Organization, and Regulation in Agriculture: Read More [+]

### Rules & Requirements

**Prerequisites:** Economics 201A or equivalent or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Production, Industrial Organization, and Regulation in Agriculture: Read Less [-]

## A,RESEC 202 Issues and Concepts in Agricultural Economics 4 Units

Terms offered: Spring 2023, Spring 2022, Spring 2021

History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models. Issues and Concepts in Agricultural Economics: Read More [+]

### Rules & Requirements

**Prerequisites:** Economics 201A-201B or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Issues and Concepts in Agricultural Economics: Read Less [-]

## A,RESEC 210 Probability and Statistics 4 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

This is an introduction to probability theory and statistical inference. It is primarily intended to prepare students for the graduate econometrics courses 212 and 213. The emphasis of the course is on the principles of statistical reasoning. Probability theory will be discussed mainly as a background for statistical theory and specific models will, for the most part, be considered only to illustrate the general statistical theory as it is developed.

Probability and Statistics: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Graduate standing or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Instructor:** Mahajan

Probability and Statistics: Read Less [ - ]

## A,RESEC 211 Mathematical Methods for Agricultural and Resource Economists 4 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013

The goal of this course is to provide entering graduate students with the basic skills required to perform effectively in the graduate program and as professional economists. The lectures place heavy emphasis on intuition, graphical representations, and conceptual understanding. Weekly problem sets provide the opportunity to master mechanical skills and computational techniques. Topics covered include real analysis, linear algebra, multivariable calculus, theory of static constrained optimization, and comparative statics.

Mathematical Methods for Agricultural and Resource Economists: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Mathematical Methods for Agricultural and Resource Economists: Read Less [ - ]

## A,RESEC 212 Econometrics: Multiple Equation Estimation 4 Units

Terms offered: Spring 2023, Spring 2022, Spring 2021

Introduction to the estimation and testing of economic models. Includes analysis of the general linear model, asymptotic theory, instrumental variable, and the generalized method of moments. In addition, a survey of time series, analysis, limited dependent variables.

Econometrics: Multiple Equation Estimation: Read More [ + ]

### Rules & Requirements

**Prerequisites:** 211 or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Econometrics: Multiple Equation Estimation: Read Less [ - ]

## A,RESEC 213 Applied Econometrics 4 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Standard and advanced econometric techniques are applied to topics in agriculture and resource economics. Techniques include limited dependent variables, time series analysis, and nonparametric analysis. Students will use computers to conduct statistical analyses.

Applied Econometrics: Read More [ + ]

### Rules & Requirements

**Prerequisites:** 211 and 212 or equivalent or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Applied Econometrics: Read Less [ - ]

## A,RESEC 214 New Econometric and Statistical Techniques 4 Units

Terms offered: Spring 2012, Spring 2011, Spring 2010

Theory and application of new and emerging approaches to estimation and inference. Bayesian, maximum entropy, and other new applications to economic problems will be emphasized. Students will use computers to conduct statistical analyses.

New Econometric and Statistical Techniques: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 211, 213 or equivalent or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

New Econometric and Statistical Techniques: [Read Less](#) [-]

## A,RESEC 219A Econometric Project Workshop 2 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Techniques for preparing econometric studies, including finding data sources, the reporting of results, and standards for placing research questions with existent literature. With faculty guidance, students prepare approved econometric projects, present projects to the class, provide comments on other student projects, and revise projects in response to faculty and student comments.

Econometric Project Workshop: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 210, 211, and 212 or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Instructors:** Auffhammer, Sadoulet

Econometric Project Workshop: [Read Less](#) [-]

## A,RESEC 219B Econometric Project Workshop 2 Units

Terms offered: Spring 2023, Spring 2022, Spring 2021

Techniques for preparing econometric studies, including finding data sources, the reporting of results, and standards for placing research questions with existent literature. With faculty guidance, students prepare approved econometric projects, present projects to the class, provide comments on other student projects, and revise projects in response to faculty and student comments.

Econometric Project Workshop: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 210, 211, and 212 or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Instructors:** Auffhammer, Sadoulet

Econometric Project Workshop: [Read Less](#) [-]

## A,RESEC 232 Empirical International Trade and Investment 2 Units

Terms offered: Spring 2010, Spring 2009, Spring 2007

Empirical aspects on international trade, foreign investment, and the environment. Issues related to testing various trade models. Topics include: testing trade models (HO, Ricardo, Specific Sector); gravity models; linkages between openness and growth; trade orientation and firm performance; pattern of trade; trade and the environment; labor markets and trade. New topics in international trade with empirical applications, such as trade models with heterogeneous firms, outsourcing and foreign investment.

Empirical International Trade and Investment: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 8 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Empirical International Trade and Investment: [Read Less](#) [-]

## A,RESEC 241 Economics and Policy of Production, Technology and Risk in Agricultural and Natural Resources 3 Units

Terms offered: Fall 2023, Fall 2022, Fall 2017

This course covers alternative models of production, resource and environmental risk management; family production function; adoption and diffusion; innovation and intellectual property rights; agricultural and environmental policies and their impact on production and the environment; water resources; pest control; biotechnology; and optimal control over space and time.

Economics and Policy of Production, Technology and Risk in Agricultural and Natural Resources: Read More [+]

### Rules & Requirements

**Prerequisites:** 201 and 202, or Economics 201A-201B, or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Economics and Policy of Production, Technology and Risk in Agricultural and Natural Resources: Read Less [-]

## A,RESEC 242 Quantitative Policy Analysis 3 Units

Terms offered: Spring 2023, Spring 2022, Spring 2021

Production versus predatory government behavior, rent seeking, social waste, and their trade-offs with the provision of growth-promoting public goods. Three failure types are distinguished: market, government, and organizational. The roles of public versus special interests are modeled to determine degree and extent of organizational failures in collective group behavior. Alternative frameworks are used to evaluate various types of policy reform.

Quantitative Policy Analysis: Read More [+]

### Rules & Requirements

**Prerequisites:** 211 or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Quantitative Policy Analysis: Read Less [-]

## A,RESEC 249 Agricultural, Food, and Resource Policy Workshop 1 Unit

Terms offered: Fall 2023, Spring 2023, Fall 2022

Presentation and criticism of ongoing research by faculty, staff and students. Not necessarily offered every semester.

Agricultural, Food, and Resource Policy Workshop: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Agricultural, Food, and Resource Policy Workshop: Read Less [-]

## A,RESEC C251 Microeconomics of Development 3 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Theoretical and empirical analyses of poverty and inequality, household and community behavior, and contract and institutions in the context of developing countries.

Microeconomics of Development: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Also listed as:** ECON C270A

Microeconomics of Development: Read Less [-]

## A,RESEC C253 International Economic Development Policy 3 Units

Terms offered: Fall 2023, Spring 2023, Fall 2022, Spring 2022, Fall 2020, Fall 2019, Fall 2018

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.

International Economic Development Policy: Read More [+]

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Also listed as:** DEVP C253/PUB POL C253

International Economic Development Policy: Read Less [-]

## A,RESEC 259 Rural Economic Development Workshop 1 Unit

Terms offered: Fall 2023, Spring 2023, Fall 2022

Presentation and criticism of ongoing research by faculty, staff and students. Not necessarily offered every semester.

Rural Economic Development Workshop: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Rural Economic Development Workshop: Read Less [-]

## A,RESEC 261 Environmental and Resource Economics 3 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Theory of renewable and nonrenewable natural resource use, with applications to forests, fisheries, energy, and climate change. Resources, growth, and sustainability. Economic theory of environmental policy. Externality; the Coasian critique; tax incidence and anomalies; indirect taxes; the double dividend; environmental standards; environmental regulation; impact of uncertainty on taxes and standards; mechanism design; monitoring, penalties, and regulatory strategy; emissions markets. Environmental and Resource Economics: Read More [+]

### Rules & Requirements

**Prerequisites:** Ph.D.-level economic theory or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Environmental and Resource Economics: Read Less [-]

## A,RESEC 262 Non-market Valuation 3 Units

Terms offered: Spring 2014, Spring 2012, Spring 2011

The economic concept of value; historical evolution of market and non-market valuation; revealed preference methods: single site demand, multi-site demand, corner solution models, and valuation of quality changes; averting behavior; the hedonic method; contingent valuation; other stated preference methods: ranking, choice, conjoint analysis; the value of life and safety; sampling and questionnaire design for valuation surveys.

Non-market Valuation: Read More [+]

### Rules & Requirements

**Prerequisites:** Ph.D.-level economic theory or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Non-market Valuation: Read Less [-]

## A,RESEC 263 Dynamic Methods in Environmental and Resource Economics 3 Units

Terms offered: Spring 2018, Spring 2016, Fall 2013

This course studies methods of analysis and optimal control of dynamic systems, emphasizing applications in environmental and natural resource economics. Continuous-time deterministic models are studied using phase plane analysis, the calculus of variations, the Maximum Principle, and dynamic programming. Numerical methods are applied to discrete time stochastic and deterministic dynamic models.

Dynamic Methods in Environmental and Resource Economics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Ph.D.-level economic theory or consent of instructor

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Dynamic Methods in Environmental and Resource Economics: Read Less [\[-\]](#)

## A,RESEC 264 Empirical Energy and Environmental Economics 3 Units

Terms offered: Spring 2023, Spring 2022, Spring 2021

This course is designed to help prepare graduate students to conduct empirical research in energy and environmental economics. The course has two broad objectives. The first is to develop an in-depth understanding of specific empirical methods and research designs that are routinely used in the field of energy and environmental economics. The second is to familiarize students with some of the economic theories and institutions that are most relevant to empirical work in this area.

Empirical Energy and Environmental Economics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 212 and 213; or equivalent

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Instructor:** Fowlie

Empirical Energy and Environmental Economics: Read Less [\[-\]](#)

## A,RESEC 265 Advanced Topics in Environmental and Resource Economics 3 Units

Terms offered: Fall 2015

Advanced topics in environmental and resource economics. Topics vary and include the economics of land, water, fisheries, forestry, pesticides, endangered species, policy instruments for environmental policy, and empirical evaluations of environmental and resource policy.

Advanced Topics in Environmental and Resource Economics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Ph.D.-level economic theory and econometrics or consent of instructor

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

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

**Instructors:** Berck, Sunding

Advanced Topics in Environmental and Resource Economics: Read Less [\[-\]](#)

## A,RESEC 269 Natural Resource Economics Workshop 1 Unit

Terms offered: Fall 2023, Spring 2023, Fall 2022

Presentation and criticism of ongoing research by faculty, staff, and students. Not necessarily offered every semester.

Natural Resource Economics Workshop: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Natural Resource Economics Workshop: Read Less [\[-\]](#)



## A,RESEC 298 Special Study for Graduate Students 1 - 6 Units

Terms offered: Fall 2023, Spring 2023, Fall 2022

All properly qualified graduate students who wish to pursue a special field of study may do so if their proposed program of study is acceptable to the member here of the staff with whom they work.

Special Study for Graduate Students: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-6 hours of independent study per week

### Summer:

6 weeks - 1-6 hours of independent study per week

8 weeks - 1-6 hours of independent study per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Letter grade.

Special Study for Graduate Students: Read Less [\[-\]](#)

## A,RESEC 299 Individual Research 1 - 12 Units

Terms offered: Fall 2023, Spring 2023, Fall 2022

Individual Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Graduate standing and consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

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

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Individual Research: Read Less [\[-\]](#)

## A,RESEC 375 Professional Preparation: Teaching of Environmental Economics and Policy 1 - 6 Units

Terms offered: Fall 2023, Fall 2022, Fall 2021

Discussion, problem review and development, guidance of discussion classes, course development, supervised practice teaching.

Professional Preparation: Teaching of Environmental Economics and Policy: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Graduate standing, appointment as a graduate student instructor, or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-2 hours of lecture and 1-2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Professional course for teachers or prospective teachers

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Formerly known as:** Agriculture and Resource Economics 300

Professional Preparation: Teaching of Environmental Economics and Policy: Read Less [\[-\]](#)

## A,RESEC 400 Professional Training in Research Methodology 1 - 6 Units

Terms offered: Fall 2023, Spring 2023, Fall 2022

Individual training for graduate students in planning and performing research under the supervision of a faculty adviser, intended to provide academic credit for the experience obtained while holding a research assistantship.

Professional Training in Research Methodology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Graduate student researcher appointment

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-6 hours of independent study per week

### Additional Details

**Subject/Course Level:** Agricultural and Resource Economics/Other professional

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Professional Training in Research Methodology: Read Less [\[-\]](#)

## **A,RESEC 602 Individual Study for Doctoral Students 1 - 12 Units**

Terms offered: Fall 2023, Spring 2023, Fall 2022

Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required for candidates of the Ph.D. May not be used for unit or residence requirements for the doctoral degree.

Individual Study for Doctoral Students: [Read More](#) [+]

### **Rules & Requirements**

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

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

### **Additional Details**

**Subject/Course Level:** Agricultural and Resource Economics/Graduate examination preparation

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Individual Study for Doctoral Students: [Read Less](#) [-]