

# 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 Programs

Environmental Economics and Policy (<https://guide.berkeley.edu/undergraduate/degree-programs/environmental-economics-policy/>): BS (Rausser College of Natural Resources)

Sustainable Business and Policy (<https://guide.berkeley.edu/undergraduate/degree-programs/sustainable-business-policy/>): Summer Minor (Department of Agricultural and Resource Economics and Haas School of Business)

## Graduate Program

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

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

Terms offered: Fall 2025, Fall 2024, Fall 2023

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.

### 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.

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

Terms offered: Spring 2025, Spring 2024, Spring 2023

History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models.

### 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.

## A,RESEC 210 Probability and Statistics 4 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

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.

### 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

## 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.

### 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.

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

Terms offered: Spring 2025, Spring 2024, Spring 2023

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.

### 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.

## A,RESEC 213 Applied Econometrics 4 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

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.

### 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.

## 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.

### 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.

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

Terms offered: Fall 2025, Fall 2024, Fall 2023

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.

### 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

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

Terms offered: Spring 2025, Spring 2024, Spring 2023

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.

### 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

## 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.

### 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.

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

Terms offered: Fall 2025, 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.

### 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.

## **A,RESEC 242 Quantitative Policy Analysis 3 Units**

Terms offered: Spring 2025, Spring 2023, Spring 2022

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.

### **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.

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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

### **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.

## **A,RESEC C251 Microeconomics of Development 3 Units**

Terms offered: Fall 2025, Fall 2024, Fall 2023

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

### **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

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

Terms offered: Spring 2024, 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.

### **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.

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

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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

### **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.

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

Terms offered: Fall 2025, Fall 2024, Fall 2023

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.

### 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.

## 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.

### 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.

## 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.

### 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.

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

Terms offered: Spring 2025, Spring 2024, Spring 2023

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.

### 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

## **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.

### **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

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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

### **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.

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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.

### **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.

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

### **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.

## **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.

### **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

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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.

### **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.

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

Terms offered: Fall 2025, Spring 2025, Fall 2024

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.

### **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.