

AGRICULTURAL AND RESOURCE ECONOMICS (ARE)

ARE 5201. Microeconomics. (3 Credits)

Beginning graduate microeconomics covering consumer and producer theory, price determination, economic efficiency, and welfare analysis.

ARE 5203. Economics Methodology: Praxis and Practice. (3 Credits)

Philosophical foundations of economics as a science and economic research. Developing skills for planning, performing, reporting, and evaluating economic research. Critical thinking about the research process, reading about and discussing research methodology, analyzing the logic and reasoning of other economists' research articles, and developing a research project.

Enrollment Requirements: M.S. student in ARE, or ARE major with Senior standing and instructor approval.

ARE 5205. Market Planning and Survey Research in the Food Industry. (3 Credits)

Overview of market planning in the food industry, with emphasis on survey design and implementation. Graduate students will lead teams of undergraduates as they work with clients to develop tailored market plans.

Enrollment Requirements: ARE 3333 or similar course. Not open for credit to students who have passed ARE 4205.

ARE 5210. Data Science for Decision Making in Applied and Resource Economics. (3 Credits)

This course introduces data science and its transformative role in decision-making across business and policy applications in applied and resource economics. Students will learn to analyze and interpret data using R, with hands-on practice in visualization, A/B testing, regression analysis, and machine learning. Designed for beginners, it emphasizes intuitive approaches and practical applications, preparing students to apply data science in real-world contexts.

Enrollment Requirements: Recommended preparation: Statistics, such as STAT 1000Q or STAT 1100Q or a similar course. Not open for credit to students who have passed ARE 4210.

ARE 5215. Sustainable Business Planning. (3 Credits)

The practice of creating a sustainable business plan as a critical step for entrepreneurial success. In this course you will learn principles of marketing, financial and human resource management as well as budgeting techniques and the legal and organizational structure of businesses while creating a sustainable business plan.

Enrollment Requirements: ARE 2210 and ARE 2215 or equivalent courses in business management and accounting with instructor's consent. Not open for credit to students who have passed ARE 4215.

ARE 5305. Sustainable Economic Development. (3 Credits)

The role of sustainable economic development of less developed economies. Microeconomic dimensions of agricultural development, food security, agricultural production and supply, foreign assistance, and government programming.

ARE 5311. Applied Econometrics I. (3 Credits)

This course deals with the estimation and inference of statistical parameters that describe the data generating process of a society, the process that cannot be reproduced like in a pure science experimentation. In other words, the data are generated from economic systems of equations that are stochastic, dynamic, and simultaneous. An attempt is made to obtain the best, unbiased, and consistent estimates of the statistical parameters that describe the inherent economic phenomena.

ARE 5313. Applied Econometrics II: Advanced Causal Inference. (3 Credits)

Econometric methods used in contemporary applied economic data analysis to examine causal relationships as well as machine learning techniques. Covered techniques include, but are not limited to, difference-in-differences, instrumental variables, regression discontinuity, synthetic control methods, and causal forest. Emphasis in lecture will be placed on formulating identification strategies and implementing in standard statistical software (of the student's choosing).

Enrollment Requirements: ARE 5311 or STAT 5405 or instructor consent. Not open for credit to students who have passed ARE 6313.

ARE 5353. Data Ethics and Equity in the Era of Misinformation. (2 Credits)

This course will introduce students to issues of ethics and equity in the contemporary practice of data science. The ability to collect, store, process, and analyze ever greater amounts of data offers great opportunities, as well as potential perils. This course will provide examine the ethical implications of data collection, usage, and distribution. Topics will include systematic approaches to assessing ethical issues; privacy and confidentiality; defining research and the responsibilities associated with conducting ethical research; implicit and structural biases in data collection and analysis.

ARE 5438. Climate Economics. (3 Credits)

Analysis of the interactive relationship between the economy and climate change. Use of advanced principles and tools of economics to focus on the costs of changes in the severity and frequency of weather events, how these costs are influenced by markets and policies, and how costs and benefits are distributed across populations within the U.S and across the globe in the short and long terms. Examination of household, firm-level, national and international decision-making as influenced by climate change, taking into account uncertainty, diverging interests, external costs, and evaluation of models used to alternative scenarios.

Enrollment Requirements: This course and ARE 3438E may not both be taken for credit.

ARE 5440. Global Energy Transitions. (3 Credits)

Recent theoretical and empirical research on the economics of clean energy transitions from a global perspective. Topics include fossil fuel extraction, critical minerals and metals, renewable and green technologies, and challenges involved in decarbonizing electricity generation and consumption. Cross-cutting themes include energy poverty and development, industrial and climate policies, environmental impacts, and political economy. Focus on developing data-driven research and empirical estimation.

Enrollment Requirements: ARE 5201 or ECON 5201 or equivalent graduate-level microeconomics course with instructor approval; ARE 5311 or ECON 5311 or equivalent graduate-level econometrics course with instructor approval. Not open for credit to students who have passed ARE 6440.

ARE 5462. Environmental and Resource Economics. (3 Credits)

Natural resource use and environmental quality analysis using economic theory. Reviews of empirical research and relevant policy issues.

ARE 5464. Cost-Benefit Analysis and Applications. (3 Credits)

Foundations and applications of cost-benefit analysis for evaluation of public policies relevant to environment, protection, health, economic development, and other public policies. Applications include data-driven assignments and analysis.

Enrollment Requirements: ARE 5201 or equivalent with instructor consent. Not open for credit to students who have passed ARE 4464.

ARE 5474. Industrial Organization: Empirical Analysis. (3 Credits)

Analysis of the structure, conduct, and performance of industries with examples from the food sector and other industries. Explains the development of testable hypotheses from theory, empirical methods, evidence on the level and type of competition, economies of size, product differentiation, entry barriers, and the impact of alternative organizational forms including cooperatives on economic performance.

ARE 5476. International Trade and Policy. (3 Credits)

Analysis of international trade and trade policy focusing on agricultural and food markets. Covers trade-related issues concerning economic development and growth. Focus on current challenges to the multilateral trading system and the theoretical foundation for understanding the economic importance of firms, international trade, and global capital flows. Introduction of methods and tools for counterfactual evaluation of trade policies. Statistical modeling techniques to analyze trade patterns and measure trade policy effects.

Enrollment Requirements: ARE 5201 or ECON 5201; ARE 5311 or ECON 5312 (or equivalents).

ARE 5480. Effective Teaching Strategies and Course Design in Applied Economics. (1-3 Credits)

Introduction to course development and strategies for effective teaching. Students will be expected to attend teaching workshops, meet weekly with the instructor and their peers to discuss teaching-related topics, and work on developing their course materials including syllabi, course learning goals, lectures, and assessments.

Enrollment Requirements: Open only to graduate students, instructor's consent is required.

May be repeated for a total of 3 credits

ARE 5495. Special Topics. (1-3 Credits)

Topics and credits to be published prior to the registration period preceding the semester offerings.

May be repeated for a total of 12 credits

ARE 5499. Independent Study in Agricultural and Resource Economics. (1-6 Credits)

This course provides the opportunity for graduate students to carry on independent reading or research in the field of the student's needs and interests.

May be repeated for a total of 24 credits

ARE 5538. Valuing the Environment. (3 Credits)

Conceptual and practical understanding of main methods used to evaluate economic benefits of environmental protection and damages from degradation. Methods include: change in productivity, hedonic pricing, travel cost method, contingent valuation, defensive expenditures, replacement costs, and cost-of-illness. Topics covered include: recreation, soil-erosion, energy, forestry, hazardous waste, air pollution, deforestation, wetlands, wildlife, biodiversity, noise, visibility, water, and water pollution. Taught together with ARE 4438E.

Enrollment Requirements: ARE 1150 or ECON 1200 or ECON 1201 or equivalent with instructor's consent. Students who have taken ARE 4438E cannot take ARE 5538 for credit.

ARE 5991. Professional Internship. (1-6 Credits)

Professional or project based work in applied economics and policy related to agribusiness management, marketing and financial analysis, food systems, environmental and resource management, sustainability, or economic development. Requires a learning agreement and student's advisor approval.

ARE 5993. Teaching Practicum in Applied Economics. (1-6 Credits)

Teaching practicum in the field of applied economics and policy related to agribusiness management, marketing and financial analysis, food systems, environmental and resource management, sustainability, economic development, and data analysis. Requires a learning agreement and student's advisor approval.

Enrollment Requirements: Open only to graduate students.

May be repeated for a total of 6 credits

ARE 6203. Economics Methodology: Praxis and Practice. (3 Credits)

Philosophical foundations of economics as a science and economic research. Developing skills for planning, performing, reporting, and evaluating economic research. Critical thinking about the research process, reading about and discussing research methodology, analyzing the logic and reasoning of other economists' research articles, and developing a research project.

Enrollment Requirements: Instructor consent; open to Ph.D. students in ARE (or Ph.D. students in Economics with Permission). Recommended preparation: One year of Ph.D. coursework in ARE (or Economics).

ARE 6305. Applied Development Economics. (3 Credits)

Overview of the current applied literature on the microeconomics of development in poor countries, as well as examples from the US. Topics include the role of land policies, agriculture, human capital, health, education, the internal structure of households (neoclassical and bargaining) and the functioning of markets.

Enrollment Requirements: ARE 5311 or ECON 5311 or equivalent.

Recommended preparation: ARE 5201 or ECON 5201 or equivalent.

ARE 6311. Applied Econometrics I. (3 Credits)

Expose students to techniques in applied economics research. Students will learn models - derivations, assumptions, and issues. The models will be practiced utilizing empirical data and interpreting results in light of economic and econometric theory.

ARE 6313. Applied Econometrics II. (3 Credits)

An introduction to econometric methods used in contemporary applied economic data analysis. Emphasis on learning how to operationalize different estimation techniques in standard statistical software.

Enrollment Requirements: ARE 5311 or ARE 6311. Not open for credit to students who have passed ARE 5313.

ARE 6440. Global Energy Transitions. (3 Credits)

Recent theoretical and empirical research on the economics of clean energy transitions from a global perspective. Topics include fossil fuel extraction, critical minerals and metals, renewable and green technologies, and challenges involved in decarbonizing electricity generation and consumption. Cross-cutting themes include energy poverty and development, industrial and climate policies, environmental impacts, and political economy. Focus on developing data-driven research and empirical estimation.

Enrollment Requirements: ARE 5201 or ECON 5201 or ECON 6201 or equivalent graduate-level microeconomics course with instructor approval; ARE 5311 or ARE 6311 or ECON 5311 or ECON 6310 or equivalent graduate-level econometrics course with instructor approval. Not open for credit to students who have passed ARE 5440.

ARE 6464. Experimental Methods for Program Evaluation. (3 Credits)

Theory and practice of field-based program experiments, often referred to as randomized controlled trials (RCTs). All aspects of experimental program evaluation, including the design of evaluation strategy and working with survey and program staff. Examples from both developing country contexts and Western country program evaluation.

Enrollment Requirements: A graduate level introduction to statistics or econometrics class or equivalent. Recommended preparation: A graduate level macroeconomic theory course.

ARE 6466. Environmental Economics. (3 Credits)

(Also offered as ECON 6466.) Economic analysis of environmental problems and corrective policy instruments. Theory of externalities and public goods, role of uncertainty and imperfect information in policy design, benefit-cost analysis, and non-market valuation. Applications to environmental problems (such as air and water pollution, hazardous waste, and occupational health and safety).

Enrollment Requirements: ARE 5201 or ECON 5201.

ARE 6468. Economics of Natural Resources. (3 Credits)

Economic concepts and issues related to the allocation of stock resources through time, the use and protection of flow resources, and the role of natural resources in economic growth.

Enrollment Requirements: ARE 5201 or ECON 5201 or equivalent.

ARE 6470. Applied Research in Environmental Economics. (3 Credits)

Designed for second year PhD students. Develops a broad perspective on the literature concerning the frontier areas of contemporary environmental economics, with an emphasis on empirical strategies for establishing causal relationships. Topics include: valuation of environmental quality and assets, evaluations of both private and public solutions to environmental problems, trade and the environment, environmental economics in developing countries, economics of climate change, and economics of automobile industry. Students will develop critical thinking skills evaluating published studies and identifying gaps in methodology and knowledge for future research.

Enrollment Requirements: ARE 5201 or ECON 5201 or ECON 6201; ARE 6311 or ECON 6310; ARE 6313 or ECON 6311.

ARE 6472. Microeconomic Applications to Food Markets. (3 Credits)

Trains students in applied microeconomics, with particular emphasis on food markets and public policy. The course is divided into three broad areas: production economics, economics of consumer behavior, and market analysis. Particular emphasis is placed on quantitative tools using empirical models and welfare economics. Students design and undertake an individualized project in their area of interest.

Enrollment Requirements: ARE 5201 or ECON 5201 and ARE 5311 or ECON 5311.

ARE 6474. Empirical Industrial Organization. (3 Credits)

Empirical Industrial Organization models that use simultaneous equations, discrete choice, and/or nonlinear econometric methods to analyze conduct and performance of brands and firms in noncompetitive industries. Includes static and dynamic modeling of pricing and advertising in differentiated product oligopolies. Antitrust policy applications in the U.S. and E.U.

Enrollment Requirements: ARE 5201, ECON 5201, or equivalent. Recommended preparation: ECON 6201 or equivalent; ARE 6311, ECON 6310, or equivalent.

ARE 6495. Graduate Research Seminar. (1 Credit)

Participation in research seminars presented by invited scholars and departmental faculty as well as active presentation of students' own research to colleagues and faculty.

May be repeated for a total of 12 credits

ARE 6695. Special Topics. (1-3 Credits)

May be repeated to a maximum of 12 credits with a change of topic. Topics and credits to be published prior to the registration period preceding the semester offerings.

May be repeated for a total of 12 credits