

# Agricultural Economics

---

## College of Agriculture, Food & Environment

The Department of Agricultural Economics provides programs leading to the degrees of Master of Science and the Doctor of Philosophy. Graduate Faculty in the department provide areas of emphasis in agricultural policy, price analysis, agricultural marketing, agribusiness, farm management, domestic and international economic development, and resource and production economics. Students must complete a core of courses in agricultural economics, economics and statistics.

Students holding degrees in agricultural economics are employed by academic institutions, local, state, and federal agencies that deal with agriculture, natural resources and economic development; private firms in the agricultural and business sectors; and agencies and governments of foreign countries. These agricultural economists conduct research, develop extension services, teach classes, and serve as managers and administrators in various types of firms and agencies.

### **Admission Requirements**

Students entering the M.S. program are expected to have at least one course in each of the following areas: intermediate microeconomics, intermediate macroeconomics, calculus, and statistics. An undergraduate degree in economics is advantageous, as is a good background in mathematics. There are no minimum GPA or GRE requirements beyond those of the Graduate School, but such information, along with letters of recommendation, is used qualitatively in the admission decision.

Students entering the Ph.D. program are expected to have the following courses: at least a two-course calculus sequence, M.S. level microeconomic theory, M.S. level macroeconomic theory, and statistics theory. Some of these courses may be taken during the student's first semester. A Master's degree in a relevant discipline is generally required for entry into the Ph.D. program. In exceptional cases a student may be admitted directly to the Ph.D. program with only a Bachelor's degree. There are no minimum GPA or GRE requirements beyond those of the Graduate School, but such information, along with letters of recommendation, is used qualitatively in the admission decision.

### **Admission Requirements**

The master's program is offered in either Plan A or Plan B. The thesis option (Plan A) requires a minimum of 24 hours of graduate credit, a research thesis and an oral final exam. Plan B requires a minimum of 36 hours of graduate credit and an oral final exam. In addition to the course work requirements, students in the Ph.D. program are required to take a comprehensive examination in microeconomics administered by the Department of Economics. Students also must complete a second-year research paper requirement as part of the preliminary examination requirements. The student must defend a dissertation prospectus during the preliminary oral examination. The ability to conduct original research in agricultural economics, documented through the completion of a dissertation, is required.

Graduate students have considerable flexibility to structure their program with respect to course work and research topics consistent with individual interests. Each student has a major professor and an advisory committee to assist in course work selection and in the thesis and dissertation research.

A graduate handbook is available that provides information regarding program content, degree options and available financial assistance.

## Course Descriptions

### AEC 503 PRICE THEORY AND APPLICATIONS. (3)

This course uses calculus to develop core concepts in microeconomics and show how they can be applied to agricultural and natural resource issues. A central objective of this course is to link mathematical techniques with economic analysis to show students that calculus provides an efficient way to study producer and consumer behavior. Prereq: AEC 303 and MA 113. [Offered in fall only.]

### AEC 510 INTERNATIONAL TRADE AND AGRICULTURAL MARKETING. (3)

A study of institutional, economic and cultural factors that influence aggregate agricultural trade and exports of individual agribusinesses. Macro issues of agricultural trade policies are examined along with elements of international marketing for agricultural products. Prereq: AEC 303 (or equivalent) and AEC 305. [Offered in fall only.]

### AEC 531 AGRICULTURAL PRICE ANALYSIS. (3)

The course links calculus-based microeconomic theory, industry-specific pricing systems, and empirical analysis of agricultural and food markets ranging from farm inputs to the consumer level. Students gain experience with tools and techniques used in empirical analysis of supply and demand. Prereq: AEC 503 and (ECO 391 or STA 570). [Offered in spring only.]

### AEC 532 AGRICULTURAL AND FOOD POLICY. (3)

This course surveys a variety of current public policies that influence the agricultural and rural economies. Students are exposed to the conflicting views of those concerned with food and agricultural policy issues in an international economy. Economic principles are used to evaluate alternatives in terms of the general welfare of society. Prereq: AEC 303 and AEC 305. [Offered in spring only.]

### AEC 545 RESOURCE AND ENVIRONMENTAL ECONOMICS. (3)

This is an advanced level course focused on economic analysis. It will help students frame natural resource and environmental problems so that they can be analyzed and solved. Major topic areas include water resources, fisheries, energy (and other non-renewable resources), agriculture, and pollution. Policy instruments such as pricing, emission fees, and tradable permits will be covered in detail. Prereq: AEC 303 or AEC 445G or consent of instructor. (Same as NRE 545.) [Offered in fall only.]

### \*AEC 580 SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (1-3)

Directed independent study of a selected problem that generally is sustained over an entire semester, requires data analysis, and results in a significant written product suitable for publication. May be repeated to a maximum of six credits. Prereq: Consent of instructor, director of undergraduate or graduate studies and completion of a proposed plan of learning objectives and outcomes prior to registration. [Offered in fall, spring and summer.]

### \*AEC 590 INTRODUCTION TO QUANTITATIVE ECONOMICS I. (3)

An introduction to mathematical approaches to economic theory. Emphasis on linear models, constrained optimization, and techniques used in comparative statics. Prereq: ECO 401 and MA 213, or graduate status, or consent of instructor. (Same as ECO 590.) [Offered in fall only.]

### AEC 606 ADVANCED AGRICULTURAL MARKETING. (3)

A critical examination of objectives and results of various types of research in market organization, marketing functions, price analysis, markets over time, space and form, market information, commodity promotion programs, quality standards, and macroeconomic linkages to marketing. Prereq: AEC 624 and ECO 601 (may be concurrent). [Offered in fall only.]

### AEC 610 INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS. (3)

This course analytically examines current empirical research in the area of agricultural trade. Prereq: ECO 601, AEC 624 and ECO 671. [Offered in spring only.]

#### AEC 620 ADVANCED PRODUCTION ECONOMICS I. (3)

An advanced treatment of production economics with emphasis on flexible product and factor price situations, factor demand functions, multiple product production, and poly-periodic production theory. Prereq: ECO 601. [Offered in fall only.]

#### AEC 622 ADVANCED AGRIBUSINESS MANAGEMENT STRATEGIES. (3)

This course integrates knowledge of economics, econometrics, business administration, finance, accounting, marketing, decision making, and research methodology. The focus is on analytical skills and scholarly academic research. Prereq: AEC 422, ECO 601 or AEC 603, an introductory course in econometrics, or consent of instructor. [Offered in spring only.]

#### AEC 624 ADVANCED QUANTITATIVE METHODS IN AGRICULTURAL ECONOMICS. (3)

This course uses statistical tools to model agricultural and economic systems. Subjects covered include: (1) the classical linear regression model, (2) statistical hypotheses tests, and (3) estimation techniques for single and simultaneous equation models. Prereq: ECO 391, STA 291 and MA 113. [Offered in spring only.]

#### AEC 626 AGRICULTURE AND ECONOMIC DEVELOPMENT. (3)

Analytical consideration of the role of agriculture in economic development in relation to overall development strategy at various stages of growth. Theoretical and policy issues of particular relevance to the agricultural development in underdeveloped agrarian economies with various resource, social, political and economic systems. Prereq: ECO 473G or consent of instructor. (Same as ECO 674.) [Offered in spring only.]

#### AEC 640 ADVANCED AGRICULTURAL POLICY. (3)

This course focuses on development of a framework to analyze alternate paradigms of the political economy. The framework focuses on the role of institutions that modify behavior of decision makers. Agricultural and food policies are evaluated in terms of the efficient use of resources and the general welfare of society. Prereq: ECO 601 or AEC 503. [Offered in spring only.]

#### AEC 645 NATURAL RESOURCE ECONOMICS. (3)

Economic analysis of natural resource use and environmental issues. Discussion of criteria for public decision making, welfare economics, market failure, benefit-cost analysis, and benefit estimation, as applied to natural resources and the environment. Prereq: ECO 590 and ECO 601.

#### AEC 646 INTERTEMPORAL ALLOCATION OF NATURAL RESOURCES. (3)

This course teaches the application of economic theory to the analysis of solutions for current and prospective natural resource problems. Such understanding will be geared toward fashioning, selecting and implementing planning associated with land, water, air, biological and other natural resources and conservation of the natural environment in serving the needs and desires of citizens. Prereq: ECO 660 a

#### AEC 653 LOCAL ECONOMIC DEVELOPMENT. (3)

The course develops the capacity to employ the theories, practices and philosophies of economic development as applied to local areas. The primary geographic focus of the course is the rural south-east of the United States, but examples will be drawn from rural areas in other developed countries. Prereq: Graduate status in agricultural economics, public administration, economics, or consent of instructor. (Same as PA 653.) [Offered in spring only.]

**AEC 661 PROGRAMMING MODELS IN AGRICULTURAL ECONOMICS. (3)**

A study of some programming models useful in agricultural economics; includes an examination of the structure of the models themselves, economic interpretation of their components and their use in research in agricultural economics. Prereq: MA 416G and either AEC 620 or ECO 601. [Offered in fall only.]

**AEC 662 QUANTITATIVE METHODS IN RENEWABLE AND NONRENEWABLE RESOURCE MANAGEMENT. (3)**

Application of dynamic optimization methods to renewable and nonrenewable resource management. Includes problem formulation, mathematical problem solving, Matlab programming, simulations and optimal policies analysis. Case examples are used to demonstrate applicability and problem formulation in finance and general and partial equilibrium. Prereq: MA 113 and MA 162 or equivalent, and AEC 661 or equivalent. (Same as FOR 662.)

**AEC 691 SOCIOLOGY OF FOOD AND AGRICULTURE. (3)**

This seminar will analyze the transformation of agriculture and the food system in the historical context of increased globalization. Emphasis is given to key historical transitions, changing social relations surrounding production and consumption of food, and shifts in regulations and policy at the local, national, and/or international levels. Such emphases provide a framework for understanding the historical roots and future prospects for the socioeconomic problems confronting contemporary U.S. and global agriculture and food economies. Prereq: Graduate standing, or consent of instructor. (Same as CLD/SOC 691.)

**AEC 724 APPLIED ECONOMETRICS. (3)**

This course introduces students to the econometric models, estimation procedures, and model applications in the literature. The course includes an overview of different econometric models, model estimations using Stata and SAS, discussion of agricultural and applied economics papers applying these models, and writing mini projects and a term paper with econometric applications. Topics include discrete and limited dependent variable models, panel data models, time-series models, instrumental variables, survival analysis, spatial econometrics and other special topics. Prereq: ECO 703 or consent of instructor. [Offered in spring only.]

**AEC 745 ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (3)**

This course is a graduate-level survey of environmental and natural resource economics. Students will use mathematical models and econometric analysis to address topics including externalities and other market failures, environmental policies, management of renewable and nonrenewable resources, and non-market valuation. Prereq: ECO 701 and 703 (or equivalent courses), or consent of instructor. (Same as ECO 726.) [Offered in fall only.]

**AEC 748 MASTER'S THESIS RESEARCH. (0)**

Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed. [Offered in fall, spring and summer.]

**AEC 749 DISSERTATION RESEARCH. (0)**

Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

**AEC 767 DISSERTATION RESIDENCY CREDIT. (2)**

Residency credit for dissertation research after the qualifying examination. Students may register for this

course in the semester of the qualifying examination. A minimum of two semesters are required as well as continuous enrollment (Fall and Spring) until the dissertation is completed and defended. [Offered in fall, spring and summer.]

**AEC 768 RESIDENCE CREDIT FOR MASTER'S DEGREE. (1-6)**

May be repeated to a maximum of 12 hours. Prereq: Consent of adviser and chairperson of department. [Offered in fall, spring and summer.]

**AEC 769 RESIDENCE CREDIT FOR DOCTOR'S DEGREE. (0-12)**

May be repeated indefinitely. Prereq: Consent of adviser and chairperson of department.

**AEC 780 SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (1-3)**

Open to graduate students who have the necessary training and ability to conduct research on a selected problem. May be repeated three times for a total of nine credits. Prereq: Consent of instructor and departmental chairperson. [Offered in fall, spring and summer.]

**AEC 790 RESEARCH WORK IN AGRICULTURE ECONOMICS. (3-9)**

Independent research under the direction of a faculty members and the Director of Graduate Studies. Prereq: Successful completion of written portion of AEC qualifying exam and permission of Director of Graduate Studies. [Offered in fall, spring and summer.]

**AEC 796 SEMINAR (Subtitle required). (3)**

An extended original investigation of a specific topic designed to give students experience in methods of research and an intensive study of a particular subject in the field of agricultural economics. May be repeated to a maximum of six credits under different subtitles. Prereq: Ph.D. applicant or candidate. [Offered in fall and spring.]

