

## AGRICULTURAL ECONOMICS AEC

### Department of Agricultural, Food, and Resource Economics College of Agriculture and Natural Resources

**801 Mathematical Applications in Economics**  
Fall. 3(3-0) RB: MTH 124 or MTH 132 R:  
Open to graduate students. SA: EC 801

Mathematical tools in economic analysis. Matrix algebra, derivatives, partial derivatives, optimization, integration, and linear differential equations.

**805 Microeconomic Analysis**  
Fall, Spring. 3(3-0) RB: AEC 801 or concurrently R: Open to graduate students. SA: EC 805

Microeconomic theory with calculus. Production, costs, demand, markets, general equilibrium, and welfare theory.

**810 Institutional and Behavioral Economics**  
Fall. 3(3-0) Interdepartmental with Economics and Resource Development. Administered by Agricultural Economics.

Relationships among institutions, individual and collective actions, and economic performance. Public choice, property rights, and behavioral theories of firms and bureaucracies.

**817 Political Economy of Agricultural and Trade Policy**  
Spring. 3(3-0) RB: (EC 805 or EC 812A) and (EC 809 or EC 813A)

Concepts of policy analysis and decision. Agricultural sector problems, behavior, and policy in the development process. Macroeconomic and trade impacts. International policies affecting trade and development. Current policy issues.

**818 Introduction to Econometrics**  
Spring. 3(3-0) Interdepartmental with Economics and Statistics and Probability. Administered by Economics. P: STT 430 R: Not open to doctoral students in the Economics major. SA: EC 820

The single equation regression model. Properties of least-squares estimators under various specifications. Multicollinearity, heteroskedasticity, serial correlation, and generalized least squares.

**821A Cross Section and Panel Data Econometrics I**  
Fall. 3(3-0) Interdepartmental with Economics and Finance and Statistics and Probability. Administered by Economics. P: EC 820B SA: EC 821

Analyses of systems of equations, panel data models, instrumental variables and generalized method of moments, M-estimation, quantile regression, maximum likelihood estimation, binary and multinomial response models, Tobit and two-part models, and other selected topics.

**821B Cross Section and Panel Data Econometrics II**  
Spring. 3(3-0) Interdepartmental with Economics and Finance and Statistics and Probability. Administered by Economics.

Analyses of quasi-maximum likelihood estimation, count data models, fractional response models, duration models, sample selection and attrition, stratified sampling, estimating treatment effects, stochastic frontier models, and other advanced topics.

**822A Time Series Econometrics I**  
Fall. 3(3-0) Interdepartmental with Economics and Finance and Statistics and Probability. Administered by Economics. P: EC 820B SA: EC 822

Analyses of time series regression, stationary time series analysis, ARMA models, Wold decomposition, spectral analysis, vector autoregressions, generalized method of moments, functional central limit theorem, nonstationary time series, unit root processes, cointegration, and other advanced topics.

**822B Time Series Econometrics II**  
Spring. 3(3-0) Interdepartmental with Economics and Finance and Statistics and Probability. Administered by Economics. P: EC 822A

Analyses of multivariate time series, time series volatility models, long memory, nonlinear time series models, and other advanced topics.

**829 The Economics of Environmental Resources**  
Spring. 3(3-0) Interdepartmental with Community, Agriculture, Recreation and Resource Studies and Economics and Forestry and Fisheries and Wildlife and Park, Recreation and Tourism Resources. Administered by Agricultural Economics. RB: Graduate Status

Economic principles related to environmental conflicts and public policy alternatives. Applications to water quality, land use, fish and wildlife, conservation, development, and global environmental issues.

**835 Introductory Econometrics**  
Spring. 3(3-0) RB: STT 430  
Estimation and interpretation of multiple regression models and their modifications when usual assumptions are not valid. Applications focus on problems faced by agricultural economists.

**839 Applied Operations Research**  
Fall. 3(3-0) RB: EC 801 SA: AEC 891B  
Linear and nonlinear programming, spatial equilibrium models, and risk programming. Applications in agribusiness management and in agricultural, environmental, and natural resource economics.

**841 Analysis of Food System Organization and Performance**  
Spring. 3(3-0)  
Industrial organization, subsector, and transaction cost approaches to analyzing coordination and performance of agricultural markets, contracting, and integration in the food systems of industrialized and developing countries. Applications to issues of organization, control, and public policy.

**845 Commodity Market Analysis**  
Fall. 3(3-0) RB: AEC 835  
Applied econometric analysis of commodity markets. Emphasis on specification and estimation of demand and supply models for forecasting. Modeling for policy evaluation. Futures and options markets. Microcomputer applications.

**851 Agribusiness Operations Management**  
Spring. 3(3-0)  
Managerial processes for agribusiness operations control. Applications of linear programming. Budgets, simulations, and dynamic programming. Statistical process control. Predictive and prescriptive analysis.

**853 Financial Management in Agriculture**  
Spring. 3(3-0)  
Financial and investment analysis tools and concepts and their application to decisions faced by agricultural, agribusiness, and food industry firms. Financial institutions and instruments, credit programs, and financial sector performance in low-income and high-income countries.

**855 Agricultural Production Economics**  
Fall. 3(3-0) RB: (EC 801 and EC 805) and (AEC 835 and EC 823)  
Analysis of production models using econometrics, mathematical programming, and simulation. Systems science perspective.

**857 Strategic Management in Agribusiness**  
Fall. 3(3-0) SA: AEC 891A  
Managerial problems faced by agribusiness firms. Strategies to interpret and respond to forces affecting the industry. Case study approach.

**861 Agriculture in Economic Development**  
Fall. 3(3-0)  
Role of agriculture in economic development of low- and middle-income countries. Theories of agricultural growth. Policy issues. Case studies.

**865 Agricultural Benefit-Cost Analysis**  
Spring. 3(3-0)  
Benefit-cost analysis of agricultural and natural resource projects, including financial and economic analysis. Case studies in project design and appraisal in low and high income countries.

**874 Field Data Collection and Analysis in Developing Countries**  
Summer of odd years. 3(3-0) RB: AEC 861 SA: AEC 891C  
Designing and conducting socioeconomic surveys to inform agricultural production, marketing, and environment/natural resource issues in developed and developing countries. Research proposal preparation, questionnaire design, sampling, data collection, and data processing and analysis using computers.

**885 Leadership in Natural Resources and Environmental Management**  
Fall. 3(3-0) Interdepartmental with Forestry and Fisheries and Wildlife and Park, Recreation and Tourism Resources. Administered by Fisheries and Wildlife.  
Theory and practice of leadership in natural resource and environmental management. Integration across disciplinary and jurisdictional divisions.

**890 Independent Study**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in the Department of Agricultural Economics. Approval of department.  
Independent study of selected topics in agricultural economics.

**891 Topics in Agricultural Economics**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.  
Selected topics in analytical methods, agri-food systems economics and management, and agricultural and natural resource development and policy.

## Agricultural Economics—AEC

### 898 Master's Research

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to master's students in the Agricultural Economics major. Approval of department.

Master's degree Plan B research.

### 899 Master's Thesis Research

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to master's students in the Agricultural Economics major. Approval of department.

Master's thesis research.

### 923 Advanced Environmental and Resource Economics

Fall. 3(3-0) Interdepartmental with Economics and Forestry and Park, Recreation and Tourism Resources and Resource Development. Administered by Agricultural Economics. RB: AEC 829 and EC 812A

Advanced economic theory of environmental management and policy. Treatment of externalities and market and non-market approaches to environmental improvement. Topics in conservation and sustainable economic growth. Applications to research and policy.

### 925 Advanced Natural Resource Economics

Spring. 3(3-0) Interdepartmental with Economics and Forestry and Park, Recreation and Tourism Resources and Resource Development. Administered by Agricultural Economics. RB: EC 812A and AEC 829 and FOR 866 SA: AEC 991H

Economic theory of managing nonrenewable and renewable resources, including optimal use, the incentives for use under decentralized markets, and public policy design. Analysis of the co-evolution of economic and ecological systems.

### 930 Dynamic Analysis in Agriculture and Natural Resources

Spring. 3(3-0) RB: EC 801 and EC 812A R: Open only to Ph.D. students in the College of Agriculture and Natural Resources or College of Business or College of Social Science or approval of department. SA: AEC 991E

Methods of dynamic optimization and their application to agricultural and natural resources problems. Discrete time dynamic programming, calculus of variations, and discrete time maximum principle.

### 932 Information Economics and Institutions in Agriculture and Natural Resources

Fall. 3(3-0) RB: (AEC 800 or AEC 810 or AEC 841) and (EC 812A and EC 812B) R: Open only to Ph.D. students in the Colleges of Agriculture and Natural Resources or Business or Social Science.

Applications to issues in agriculture, agribusiness, the food system, natural resources, and the environment. Asymmetric information, incomplete markets, principal/agent issues, transaction costs, and the design of contracts and other institutions.

### 977 Professional Practice in Agricultural Economics

Spring. 3(3-0) R: Open only to Ph.D. students in the Department of Agricultural Economics or Department of Economics. SA: AEC 947

Matching appropriate tools to applied problems in agricultural and resource economics. Individual and team preparation, under tight deadlines, of professional analyses and oral presentations for diverse audiences. Use of peer review.

### 978 Research Methodologies in Agricultural and Resource Economics

Spring. 3(3-0) R: Open only to Ph.D. students in the College of Agriculture and Natural Resources or College of Business or College of Social Science. SA: AEC 991F

Alternative research philosophies, types of knowledge, and kinds of research. Critical appraisal of facts, theories, and values in economic research. Testing and communication of research results. Development of a research proposal.

### 991 Advanced Topics in Agricultural Economics

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to Ph.D. students in the colleges of Agriculture and Natural Resources, Business, and Social Science; or with department approval.

Advanced topics such as price analysis, finance, risk and modeling techniques, agri-food systems, environmental economics and management, and agricultural and natural resource development and policy.

### 999 Doctoral Dissertation Research

Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in the Department of Agricultural Economics. Approval of department.

Doctoral dissertation research.