

923. Advanced Environmental and Resource Economics

Spring of even years. 3(3-0) Interdepartmental with Economics; Forestry; Park, Recreation and Tourism Resources; and Resource Development. P: (AEC 829 and EC 805)

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. Environmental and Resource Economics Research

Spring of odd years. 3(3-0) Interdepartmental with Forestry; Resource Development; Park, Recreation and Tourism Resources; and Economics. P: (AEC 829 and EC 805)

Topics such as contingent or non-market valuation, institutional analysis, pollution prevention, environmental quality and location, recreational demand modeling, and environmental risk management. Research process in environmental and resource economics.

SA: AEC 991H

930. Dynamic Models in Agricultural and Resource Economics

Spring. 3(3-0) P: (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.

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.

SA: AEC 991E

961. Seminar in International Agricultural Development

Fall of even years. 3(3-0) P: (AEC 861 and EC 805 and EC 809) R: Open only to Ph.D. students in the College of Agriculture and Natural Resources or College of Business or College of Social Science.

Advanced topics and analytical methods in international agricultural development research. New theories and their application to specific problems.

SA: AEC 991B

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.

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.

SA: AEC 947.

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.

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.

SA: AEC 991F

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 College of Agriculture and Natural Resources, College of Business, and College of 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 Ph.D. students in Agricultural Economics. Approval of department.

AGRICULTURAL ENGINEERING

AE

**Department of Agricultural Engineering
College of Agriculture and Natural Resources**

852. Systems Modeling and Simulation

Fall of even years. 3(3-0) Interdepartmental with Fisheries and Wildlife; Forestry; and Resource Development. Administered by Fisheries and Wildlife. P: STT 422 or STT 442 or STT 464 or GEO 463.

General systems theory and concepts. Modeling and simulation methods. Applications of systems approach and techniques to natural resource management, and to ecological and agricultural research.

853. Applied Systems Modeling and Simulation for Natural Resource Management

Spring of odd years. 3(2-2) Interdepartmental with Fisheries and Wildlife; Forestry; Resource Development; and Zoology. Administered by Fisheries and Wildlife. P: FW 820 or BE 486 or ZOL 851 or approval of department. R: Open only to seniors and graduate students

Mathematical models for evaluating resource management strategies. Stochastic and deterministic simulation for optimization. System control structures. Team modelling approach.

AGRICULTURAL TECHNOLOGY AND SYSTEMS MANAGEMENT

ATM

**Department of Agricultural Engineering
College of Agriculture and Natural Resources
College of Engineering**

150. Metal Fabrication Technology

Fall. 2(1-2) R: Open only to students in the Biosystems Engineering or Building Construction Management major.

Physical principles and safety techniques for electric and gas welding. Soldering, brazing, cutting, tool use, machine shop equipment use, and hot and cold metalworking.

195. National Electrical Code Review

Fall. 3(3-0) P: (AE 094 or BCM 230)

Electrical installation problems. Principles of and compliance with the National Electrical Code.

SA: AE 095

240. Machine Systems and Management

Spring. 3(2-2) P: (CSE 101 or CSE 131 or AT 090)

Principles, analysis, performance, operation, and management of agricultural machines.

252. Gasoline and Diesel Engine Technology

Fall. 3(2-2)

Operating principles of gasoline and diesel engines and their systems. Operation and maintenance requirements.

254. Fluid Power Technology

Spring. 2(1-2) R: Open only to students in Agriculture and Natural Resources.

Fluid power in mobile equipment. Operation and characteristics of system components and circuits. Component disassembly. System testing and diagnosis. Offered first ten weeks of semester.

261. Principles of Animal Environments

Spring. 2(1-2) Interdepartmental with Animal Science.

Animal environment requirements. Heat and moisture production rates. Psychrometrics of air and building materials. Heat loss and ventilation systems. Offered first ten weeks of semester.

SA: AE 061, ATM 326

431. Irrigation, Drainage and Erosion Control Systems

Fall. 3(2-2) P: MTH 116 or MTH 120; CSS 210. R: Not open to freshmen and sophomores.

Principles of soil and water conservation engineering including: land and soil surveying, basic hydraulics, hydrology, soil moisture, and soil and water conservation practices with applications to irrigation, drainage and erosion control systems.