

**Descriptions — Agricultural Economics of Courses**

**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 graduate students in Agricultural Economics. Approval of department.*

**923. Theory of Resource and Environmental Economics**  
*Spring of even-numbered years. 3(3-0) Interdepartmental with Resource Development; Forestry; Park, Recreation and Tourism Resources; and Economics.*  
*P: AEC 829, EC 805.*  
 Economic theory of environmental change and control. Market and non-market allocation mechanisms. Temporal issues of conservation and growth. Contemporary issues in research and policy.

**947. Analysis of Food Systems Organization**  
*Summer. 3(3-0)*  
*P: AEC 810, AEC 841, AEC 845.*  
 Public and private policy issues related to the organization and performance of food systems.

**991. Advanced Topics in Agricultural Economics (MTC)**  
*Fall, Spring, Summer. 2 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.*  
 Topics such as international agricultural development, environmental economics, and trade policy.

**992. Seminar in Agricultural Economics**  
*Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.*  
*R: Open only to Ph.D. students in Agricultural Economics. Approval of department; application required.*  
 Price analysis, development, risk, trade, dynamic modeling research methods, finance and environmental economics.

**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 TECHNOLOGY AND SYSTEMS MANAGEMENT ATM**

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

**315. Occupational and Personal Safety**  
*Spring. 2(2-0)*  
*P: CSS 101 or ANS 110 or AEE 101 or HRT 201. R: Open only to College of Agriculture and Natural Resources majors.*  
 Principles of safety problem solving. Accident causation and prevention. Laws and regulations. Machinery, electrical, chemical and fire safety. Security. Safety program development.

**326. Principles of Animal Environments**  
*Spring. 2(2-0)*  
*P: MTH 116 or MTH 120; CPS 101 or CPS 131. R: Open only to College of Agriculture and Natural Resources majors.*  
 Heat and moisture balances for confined livestock. Interior environment and its control. Waste management.

**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.

**490. Independent Study**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.*  
*P: ATM 231 or ATM 240 or BCM 311. R: Open only to majors in Agricultural Technology and Systems Management. Approval of department; application required.*  
 Supervised individual student research and study in agricultural technology and systems management.

**491. Special Topics in Agricultural Technology and Systems Management**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.*  
*P: ATM 231 or ATM 240 or BCM 311. R: Open only to majors in Agricultural Technology and Systems Management.*  
 Special topics in agricultural technology and systems management.

**804. Agricultural Mechanization in Developing Countries**  
*Fall of odd-numbered years. 3(3-0)*  
*R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.*  
 Human, animal and mechanical power for smaller farms. Machine selection, local manufacturing, ownership patterns.

**807. Human Factors Engineering**  
*Fall of even-numbered years. 3(3-0)*  
*R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.*  
 Ergonomics. Analysis of machine designs, operation, and working environment in relation to human limitations and capabilities. Procedures to develop maximum human-machine compatibility and performance.

**831. Water, Technology and International Development**  
*Spring of even-numbered years. 3(3-0)*  
*P: AE 481 or ANR 489 or ATM 431 or CSS 210. R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.*  
 Water resources planning and development for irrigated agriculture. Technological, agronomic, environmental, social and political constraints. Case studies.

**840. Analysis of Physical Systems**  
*Fall. 3(3-0)*  
*P: ATM 440 or BCM 311 or MGT 306. R: Open only to graduate students in College of Agriculture and Natural Resources.*  
 Identification and definition of systems problems in agricultural and construction industries. Model formulation and estimation.

**845. Process Network Theory Applied to Agroecosystems**  
*Spring of odd-numbered years. 4(4-0)*  
*R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.*  
 Numerical framework for the technical, economic and environmental analysis of agricultural and biological systems.

**890. Special Problems**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.*  
*R: Approval of department.*  
 Individual study of selected topics.

**891. Advanced Topics in Agricultural Technology and Systems Management**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.*  
*R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.*  
 New developments in agricultural technology and systems management.

**899. Master's Thesis Research**  
*Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 99 credits in all enrollments for this course.*  
*R: Open only to graduate students in Agricultural Technology and Systems Management.*

**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 Technology and Systems Management.*

**AGRICULTURE AND NATURAL RESOURCES ANR**

**College of Agriculture and Natural Resources**

**101. Preview of Science**  
*Fall. 1(1-0) Interdepartmental with Natural Science, Engineering, and Social Science. Administered by Natural Science.*  
*R: Approval of college.*  
 Overview of natural sciences. Transitional problems. Communications and computer skills. Problem solving skills. Diversity and ethics problems in science and society.

**192. Environmental Issues Seminar**  
*Fall, Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science, Engineering, and Social Science. Administered by Natural Science.*  
*R: Open only to students in the College of Agriculture and Natural Resources, College of Engineering, College of Natural Science, and College of Social Science. Approval of college.*  
 Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.

**350. Leadership Development for Agriculture and Natural Resources**  
*Spring. 2(2-0)*  
*R: Not open to freshmen and sophomores. Approval of college; application required.*  
 Preparation for community leadership. Field observation of social, economic and political problems. Emphasis on awareness, action and involvement. Seminars and interviews.

**392. Agriculture and Natural Resources Seminar**  
*Spring. 1(2-0)*  
*R: Not open to freshmen and sophomores.*  
 Current agricultural, natural resources and environmental problems and solutions. Discussion leaders from various disciplines.