

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 Ph.D. students in Agricultural Economics. Approval of department.

Doctoral dissertation research.

AGRICULTURAL AE ENGINEERING

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

150 Metal Fabrication Technology
 Fall. 2(1-2) SA: ATM 150

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

240 Machine Systems and Management
 Spring. 3(2-2) P:M: (CSE 101 or CSE 131 or AT 090) SA: ATM 240

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

252 Gasoline and Diesel Engine Technology
 Fall. 3(2-2) SA: ATM 252

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

254 Fluid Power Technology
 Spring. 2(2-2) R: Open only to students in Agriculture and Natural Resources. SA: AE 054, ATM 254

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. SA: AE 061, ATM 261

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.

490 Independent Study
 Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course. P:NM: AE 152 or ME 391 or MTH 235. R: Open only to students in the College of Agriculture and Natural Resources. Approval of department; application required.

Supervised individual student research and study in agricultural engineering.

491 Special Topics in Agricultural Engineering
 Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P:NM: AE 152 or ME 391 or MTH 235. R: Open only to students in the College of Agriculture and Natural Resources. Approval of department.

Special topics in agricultural engineering.

AGRICULTURAL AT TECHNOLOGY

Institute of Agricultural Technology College of Agriculture and Natural Resources

290 Independent Study in Agricultural Technology
 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 freshmen or sophomores in the Institute of Agricultural Technology.

Supervised individual study on experimental, theoretical or applied topics related to agricultural science and technology.

291 Selected Topics in Agricultural Technology
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to freshmen or sophomores in the Institute of Agricultural Technology.

Selected topics of current interest in agricultural science and technology.

293 Professional Internship in Agricultural Technology
 Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to freshmen or sophomores in the Institute of Agricultural Technology.

Supervised professional experience in agencies, business and industry related to a student's major field of study.

AGRICULTURAL ATM TECHNOLOGY AND SYSTEMS MANAGEMENT

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

431 Irrigation, Drainage and Erosion Control Systems
 Fall. 3(2-2) RB: (MTH 116 and CSS 210) R:
 Not open to freshmen or 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.

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.

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 master's students in Agricultural Technology and Systems Management.

Masters thesis research.

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.

Doctoral dissertation research.

AGRICULTURE ANR AND NATURAL RESOURCES

College of Agriculture and Natural Resources

101 Preview of Science
 Fall. 1 credit. Interdepartmental with Natural Science; Engineering; Social Science. Administered by College of 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. Science and society.

101A Academic and Career Decision Making
 Fall, Spring. 2(2-0)

Exploration of the career possibilities in agriculture, natural resources and related areas.