

**AGRICULTURAL ENGINEERING**

**891\*** **Advanced Topics in Agricultural Engineering(MTC)**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 9 credits.  
 P: Approval of department R: Graduate students Undergraduate degree in Engineering  
 Advanced topics in agricultural engineering.  
 QA: AE 890

**892A\*** **Research Methods in Agriculture Engineering**  
 Spring. 1(1-0)  
 R: Graduate Students Engineering or Agriculture  
 Discussion of procedures and methods for designing and executing research projects.  
 QA: AE 820

**892B\*** **Agricultural Engineering Seminar**  
 Fall. 1(1-0)  
 R: Graduate Students Engineering or Agriculture  
 Current topics in Agricultural Engineering

**899\*** **Master's Thesis Research**  
 Fall, Spring, Summer. 1 to 15 credits.  
 P: Approval of department R: Graduate students AE  
 QA: AE 899

**999\*** **Doctoral Dissertation Research**  
 Fall, Spring, Summer. 1 to 15 credits.  
 P: Approval of department R: Graduate students AE  
 QA: AE 999

**AGRICULTURAL TECHNOLOGY AND SYSTEMS MANAGEMENT ATM**

**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.  
 QA: ATM 415

**326.** **Principles of Animal Environments**  
 Spring. 2(2-0)  
 P: MTH 116 or MTH 120; CPS 100 or CPS 130 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.  
 QA: MTH 110 CPS 100 QA: ATM 426

**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.  
 QA: MTH 111 CSS 210 QA: ATM 231 ATM 431

**440\*** **Agricultural Machinery Systems**  
 Fall. 3(3-0)  
 P: CSS 210; MTH 110 or MTH 116; CPS 100 or CPS 130 or CPS 131 R: Juniors and Above Agriculture and Natural Resources  
 Principles, analysis, management, and economics of agricultural machinery systems considering weather conditions, cultural practices, crop rotation, labor and energy.  
 QP: MTH 108 ORMTH 111CPS 100OR QA: ATM 440

**490\*** **Independent Study**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 8 credits.  
 P: ATM 231 or ATM 240 or BCM 311 R: Juniors and above ATM Approval of department; application required  
 Supervised individual student research and study in Agricultural Technology and Systems Management.  
 QP: ATM 231 ORATM 240ORATM 311 QA: ATM 480

**491\*** **Special Topics in Agricultural Technology and Systems Management**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 8 credits.  
 P: ATM 231 or ATM 240 or BCM 311 R: Juniors and above ATM  
 Special Topics in Agricultural Technology and Systems Management.  
 QP: ATM 231 ORATM 240ORATM 311 QA: ATM 490

**804\*** **Appropriate Agricultural Mechanization in Developing Countries**  
 Fall of odd-numbered years. 3(3-0)  
 R: Seniors and Above  
 Appropriate agricultural mechanization in developing countries including humane, animal and mechanical power for the smaller farms. Machine selection, local manufacturing, ownership patterns, increasing production and decreasing losses.  
 QA: ATM 804

**807\*** **Human Factors Engineering (Ergonomics)**  
 Fall of even-numbered years. 3(3-0)  
 R: Seniors and above  
 Analysis of machine designs, operation and working environment in relation to human limitations and capabilities. Study of procedures to develop maximum human-machine compatibility and performance.  
 QA: ATM 807

**831\*** **Water, Technology and International Development**  
 Spring of even-numbered years. 3(3-0)  
 P: CSS 210 or ATM 431 or AE 481 or ANR 399 R: Seniors and above  
 Water resources planning and development for irrigated agriculture. Technological, Agronomics, Environmental, Social and political constraints will be presented and discussed. Case studies from selected areas will be presented.  
 QA: ATM 890

**836\*** **Microclimate and Its Measurement**  
 Spring. 4(3-3) Interdepartmental with the Department(s) of Geography.  
 P: MTH 116 R: Juniors and Above  
 Introductory course in microclimatology and the principles of instrumentation required to adequately quantify this environment. The primary study region will be: area-field scale & smaller; height-surface +10 to-1 m; and time-sec to hours.  
 QP: MTH 109 MTH 111 QA: ATM 436 ATM 808

**840\*** **Analysis of Physical Systems**  
 Fall. 3(3-0)  
 P: ATM 440 or BCM 311 or MGT 306 R: Seniors and above ANR  
 Identification and definition of systems problems in the agriculture and construction industries. Model formulation and estimation. Consideration of current approaches and models.  
 QA: ATM 806

**845\*** **Process Network Theory Applied To Agroecosystems**  
 Spring of odd-numbered years. 4(4-0)  
 P: 1 Year of Calculus R: Seniors and above  
 Process network theory providing a numerical framework for the technical, economic and environmental analysis of agricultural and biological systems.  
 QA: ATM 890

**890\*** **Special Problems**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 6 credits.  
 P: Approval of department R: Graduate students  
 Individual study or research on selected topics.  
 QA: ATM 880

**891\*** **Advanced Topics in Agricultural Technology and Systems Management**  
 Fall, Spring, Summer. 2 to 4 credits.  
 May reenroll for a maximum of 12 credits.  
 R: Seniors and above  
 New developments in agricultural technology and systems management.  
 QA: ATM 890

**899\*** **Master's Thesis Research**  
 Fall, Spring, Summer. 1 to 8 credits.  
 May reenroll for a maximum of 15 credits.  
 P: Approval of department R: Graduate students ATM  
 QA: ATM 899

**999\*** **Doctoral Dissertation Research**  
 Fall, Spring, Summer. 1 to 24 credits.  
 May reenroll for a maximum of 48 credits.  
 P: Approval of department R: Graduates ATM  
 QA: ATM 999

**AGRICULTURE AND NATURAL RESOURCES ANR**

**350\*** **Leadership Development for Agriculture and Natural Resources**  
 Spring. 2(2-0)  
 R: Not open to Freshmen and Sophomores  
 Approval of college: application required  
 Leadership development. Preparation for community leadership. Firsthand look at social, economic and political problems. Emphasis on awareness, action and involvement. Series of seminars and interviews. Field trips required.  
 QA: ANR 350

**392\*** **Agriculture and Natural Resources Seminar**  
 Spring. 1(2-0)

Current agricultural, natural resources and environmental problems and solutions as presented by discussion leaders from various disciplines.  
 QA: ANR 425