E-10

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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. 2-3-0 P: CSS 101 or ANS 119 or AE 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. 2-3-0 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: ATM 415

431. Irrigation, Drainage and Erosion Control Systems Fall. 3-2-3 P: MTH 116 or MTH 120; CPS 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: ATM 231

440*. Agricultural Machinery Systems Fall. 3-0-0 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. QA: MTH 108 OR MTH 111 CPS 1000R QA: ATM 460

490*. Independent Study Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 9 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. QA: ATM 490

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. QA: ATM 490

804*. Appropriate Agricultural Mechanization in Developing Countries Fall of odd-numbered years. 3-0-3 R: Seniors and Above. QA: ATM 804

807*. Human Factors Engineering (Ergonomics) Fall of even-numbered years. 3-0-3 R: Seniors and above. Analysis of machine design, 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. 3-0-3 P: MTH 210 or ATM 431 or AE 461 or ANR 399 R: Seniors and above. ATM Water resources planning and development for irrigated agriculture. Technological, Agronomic, Environmental, Social and political constraints will be presented and discussed. Case studies from selected areas will be presented. QA: ATM 800

838*. 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 40 to 1 m; and time-to see to hours. QA: MTH 108 MTH 111 QA: ATM 436 ATM 808

840*. Analysis of Physical Systems Fall. 3-0-0 P: ATM 440 or BCM 311 or MGT 306 R: Seniors and above. 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

880*. 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

881*. Advanced Topics in Agricultural Technology and Systems Management Fall, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 12 credits. R: Juniors 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 45 credits. P: Approval of department R: Graduate students 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

352*. Agriculture and Natural Resources Seminar Spring. 1-3-0 Current agricultural, natural resources and environmental problems and solutions as presented by discussion leaders from various disciplines. QA: ANR 425
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