

AGRICULTURAL SYSTEMS TECHNOLOGY (AGST)

AGST 812 Hydraulic Power Systems

Prerequisites: AGST 245 and 312

Description: Theory and application of fluids under controlled pressure to perform work in mobile and industrial applications. Operation of components and functional planning of circuits with emphasis on troubleshooting and analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

AGST 816 Sensors and Control Systems for Agri-Industries

Prerequisites: AGST 245

Description: Application of sensors for measurement of process control variables and implementation of microcomputer-based measurement and control systems. Basic electrical and electronic instrumentation plus control of electrically, pneumatically and/or hydraulically powered systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

AGST 832 Mechanized Agricultural Systems

Prerequisites: Permission

Notes: Offered odd-numbered calendar years.

Description: Advanced concepts of equipment used in agriculture. Site specific management (precision agriculture). Hardware development and information technologies applied to generic agricultural production.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

AGST 833 Equipment and Tractor Testing

Crosslisted with: AGST 433

Prerequisites: AGST 232; and STAT 218 or STAT 380 or MECH 321

Notes: Offered spring semester in even-numbered calendar years.

Description: Principles and procedures involved in testing agricultural equipment and tractors. Actual test planned, scheduled, conducted and reported. Test may be based upon procedures used at the Nebraska Tractor Testing Laboratory or involve other equipment being used for research in the department.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGST 836 Embedded Controls for Agricultural Applications

Crosslisted with: AGEN 436, AGST 436, AGEN 836

Prerequisites: AGEN/BSEN 260 or AGST 416

Description: Introduction to the basics of embedded controller programming, and the development of Controller Area Network (CAN) bus systems in agricultural applications. Interfacing sensors with analog and digital signals, closed loop control of actuators, transmission and reception of CAN messages, programming of CAN messages in a distributed controller set up for sensor data acquisition, and actuator control will be studied.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

AGST 852 Irrigation Systems Management

Crosslisted with: AGST 452, PLAS 452

Prerequisites: AGST 109 or PHYS 141 or PHYS 151 or PHYS 211

Notes: PLAS/SOIL 153 recommended.

Description: Irrigation management and the selection, evaluation, and improvement of irrigation systems. Includes soil-water measurement, crop water use, irrigation scheduling, irrigation efficiency, measurement of water flow, irrigation systems, groundwater and wells, pumping systems, applying chemicals with irrigation systems, and environmental and water resource considerations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Prerequisite for: AGEN 854, AGST 854; AGST 855

AGST 854 Irrigation Laboratory and Field Course

Crosslisted with: AGEN 854

Prerequisites: AGEN 453/853, or AGST 452/852

Notes: Offered during the summer pre-session in even calendar years.

Description: A laboratory and field course which emphasizes irrigation water supply and distribution systems. Laboratory topics include performance of surface, sprinkler, and drip irrigation systems; pipeline hydraulics; flow in streams, canals, and irrigation pipelines; irrigation pumping systems; irrigation well hydraulics; and soil water properties. The field trip includes visits to irrigation water supply and hydroelectric power projects; water resources agencies; irrigation field research sites; and manufacturers and installers of agricultural irrigation systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SUMMER

AGST 855 Advanced Irrigation Management

Prerequisites: AGST 852 or AGEN/BSEN 853

Description: Theory and practice of on-farm irrigation management including: irrigation economics; soil-plant-water relations; evapotranspiration; remote sensing; irrigation scheduling; real-time operation and maintenance of irrigation systems; yield response functions and deficit irrigation; sensors and apps for irrigation; environmental impact of irrigation and drainage; impact of irrigation on consumptive use at the watershed scale; irrigation district operation and maintenance; and international irrigation development.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGST 862 Managing Technology in Agricultural Systems

Crosslisted with: AGST 462

Prerequisites: Senior standing in AGST

Notes: Capstone course.

Description: Team-based activities to evaluate integration of technology into, and utilization of resources for, agricultural systems; perform technical and economic evaluations; make technical and economic recommendations; and develop professional written and oral reports. Topics include technology system performance and management, project scheduling and planning, cost estimation, reliability analysis, and risk assessment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Experiential Learning: Case/Project-Based Learning

AGST 865 Food Engineering Unit Operations

Crosslisted with: FDST 465, FDST 865, AGST 465

Prerequisites: FDST/AGST 363.

Description: Unit operations and their applications to food processing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

AGST 869 Bio-Atmospheric Instrumentation

Crosslisted with: GEOG 469, PLAS 407, METR 469, AGST 469, NRES 469, AGRO 869, GEOG 869, HORT 807, METR 869, NRES 869

Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.

Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

AGST 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOIL 475, PLAS 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, AGST 475

Prerequisites: Senior undergraduate or graduate student status.

Notes: Capstone course.

Description: Introduces methods to identify, analyze, strategize, justify and develop planning approaches to protect water quality from nonpoint source contamination. Focuses on identifying present water quality issues and situations, investigating adverse impacts on whole systems and subsystems over time, developing effective planning strategies, and assessing strategy effectiveness.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGST 892 Special Topics in Agricultural Systems Technology

Crosslisted with: AGST 492

Prerequisites: Permission

Description: Subject matter in emerging areas of Mechanized Systems Management not covered in other courses within the curriculum. Topics, activities, and delivery methods vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

AGST 896 Principles and Problems in Mechanized Agriculture

Crosslisted with: AGST 496

Prerequisites: 15 hours in AGST or closely related area.

Description: Individual or group projects in research, literature review, or extension of course work under the supervision and evaluation of a departmental faculty member.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

AGST 897 Masters Project

Crosslisted with: AGEN 897, BSEN 897

Prerequisites: Admission to M.S. in Agricultural and Biological Systems Engineering or M.S. in Agricultural Systems Technology or M.S. in Mechanized Systems Management, and permission of major advisor

Notes: Intended for students who are pursuing an option B master's degree in Agricultural and Biological Systems Engineering, or Agricultural Systems Technology or Mechanized Systems Management.

Description: Conception, design, development, and completion of a project that requires data collection, synthesis, analysis of results, and the development of a final written report that will be defended in the final oral examination.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Pass No-Pass



AGST 898 Special Projects in Agricultural Systems Technology

Prerequisites: 15 hours in agricultural systems technology or closely related area

Description: Individual project specifically designed for a student to pursue or explore a special topic under the guidance and evaluation of a faculty member.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 5

Grading Option: Grade Pass/No Pass Option

AGST 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Grading Option: Pass No-Pass