

# TECHNOLOGY SYSTEMS MANAGEMENT

## TSM

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

#### 121 Fundamentals of Electricity

Fall. 4(3-2) P: MTH 103 or MTH 116 or (MTH 124 or concurrently) Not open to students with credit in AE071.

Application of Ohm's law. Kirchoff's laws. Series and parallel circuits. Inductive and capacitive reactance. Power factor. Practical single and three-phase electrical systems. Electromagnetic induction. Transformers. Environmental constraints in power use and production.

#### 122 Alternating and Direct Current Machines

Spring. 3(3-3) P: TSM 121 Not open to students with credit in AE 084.

Types and characteristics of electric motors. Connecting, reversing and servicing of AC and DC motors and drives. Stepper motors. Variable frequency drives for induction motors. Offered first ten weeks of semester.

#### 223 Fundamentals of Automation and Controls

Fall. 4(3-2) P: TSM 121 Not open to students with credit in AE 083.

On-off controllers for electric actuators. Installation according to code. Ladder-logic. Programmable logic controllers. Installation and programming. Interfacing to a computer.

#### 224 Digital Systems, Sensors and Measurements

Spring. 3(3-3) P: TSM 121 or PHY 184 Not open to students with credit in ECE 230.

Electrical components in transient and steady state operation. Thermo-electric, piezoelectric, magnetic, resistive and capacitive sensors. Electro-optical devices. Digital circuits. Data acquisition. Offered first ten weeks of semester.

#### 251 Information Technology in Agricultural Systems

Fall. 3(2-2) Interdepartmental with Community, Agriculture, Recreation and Resource Studies. Administered by Technology Systems Management. RB: Computer science course

Applications and trends in information systems. Evaluation and use of computer systems, peripherals, networks, presentation systems, and communication systems.

#### 341 Power and Machinery Systems

Fall. 3(2-2) P: (PHY 231 and TSM 122 and TSM 223 and TSM 224 and CEM 141) or (BE 456 and TSM 224 and CEM 141) or (LBS 171 and TSM 122 and TSM 223 and TSM 224 and LBS 172) or (BE 456 and TSM 224 and LBS 172)

Principles, performance, operation, and management of agricultural machine systems and tractors.

#### 342 Power and Control Hydraulics

Spring. 3(2-2) P: TSM 341 or (BE 331 and ECE 345) Not open to students with credit in BE 430.

Properties of hydraulic fluids. Fixed and variable displacement pumps and motors. Control valves and circuitry. Measurement and analysis of hydraulic systems. Component selection.

#### 343 Principles of Precision Agriculture

Fall. 3(2-2) P: MTH 103 or MTH 114 or MTH 116 or MTH 124 or MTH 132

Global positioning systems (GPS), yield monitors, and computer software. Analysis and interpretation of field maps. Variable-rate application. Economics of precision agriculture.

#### 431 Irrigation, Drainage and Erosion Control

Fall. 3(2-2) P: MTH 116 and CSS 210 R: Not open to freshmen or sophomores.

Soil and water conservation engineering, including land and soil surveying, basic hydraulics, hydrology, soil moisture, and soil and water conservation practices. Applications to irrigation, drainage, and erosion control systems.

#### 475 International Studies in Technology Systems Management

Fall, Spring, Summer. 1 to 6 credits. Fall: Abroad. Spring: Abroad. Summer: Abroad. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department; application required.

Study abroad emphasizing technology and systems issues affecting agriculture and natural resources in world, national, and local communities.

#### 481 Technology Systems Management - Capstone I (W)

Fall. 3(3-0) P: (TSM 341 and TSM 342 and TSM 343 and TSM 351 and ABM 332 and GEO 221) and completion of Tier I writing requirement R: Open to seniors in the Technology Systems Management major.

Project management. Integration of technology systems concepts. Teamwork and leadership skills. Financial and time constraints. Ethics, safety, and liability. Expectations of society.

#### 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. R: Approval of department.

Supervised individual student research and study in technology systems management.

#### 491 Special Topics

Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.

Special topics in technology systems management.

#### 493 Professional Internship in Technology Systems Management

Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits A student may earn a maximum of 6 credits in any or all of these courses: ABM 493, ANR 493, AEE 493, ANS 493, CSS 493, EEP 493, FIM 493, FW 493, HRT 493, PKG 493, PLP 493, PRR 493, and RD 493. R: Open to juniors or seniors in the Technology Systems Management major. Approval of department; application required.

Supervised professional experiences in agencies and businesses related to a student's major field of study.