Technology Systems Management (TSM)

Courses primarily for undergraduates:

TSM 110. Introduction to Technology. (1-0) Cr. 1. F. Prereq: AST and I Tec majors only or permission of instructor. Team-oriented introduction to agricultural systems technology and industrial technology. Internships, careers, competencies, academic success strategies, industry visits, transition to academic life.

TSM 111. Experiencing Technology. (0-2) Cr. 1. S. Prereq: AST or I Tec majors only or permission of instructor. Laboratory-based, team-oriented experiences in a spectrum of topics common to the practice of technology. Report writing, internships, competencies, industry visits.

TSM 115. Solving Technology Problems. (2-2) Cr. 3. F.S. Prereq: MATH 140 or higher (can be taken concurrently). Solving technology problems and presenting solutions through technical reports. Unit conversions, unit factor method, SI units, significant digits, graphing and curve fitting. Use of spreadsheet programs to solve and present technology problems. Solution of technology problems using computer programming languages.

TSM 116. Introduction to Design in Technology. (2-2) Cr. 3. F.S. 2D projections and 3D representations of objects, national and international standards for documentation, manufacturing processes, design projects, and teamwork. Free-hand sketching techniques and parametric solid modeling will be covered.


TSM 210. Fundamentals of Technology. (3-0) Cr. 3. F.S. Prereq: TSM 115 or equivalent, MATH 140 or higher. Introduction to problem solving related to fundamental agricultural and/or industrial technology systems: Basic laws of energy, force, and mass, and their application in simple mechanical systems and thermal systems. Mathematical tools needed for data analysis. Introduction to modern information technology: GPS and Internet, their basic framework and implementations. Introduction to engineering economics: using the time value of money to make economic decisions.

TSM 216. Advanced Technical Graphics, Interpretation, and CAD. (2-2) Cr. 3. F.S. Prereq: TSM 116 Advanced design systems incorporating 2D and 3D design and productivity tools for use in manufacturing settings. Topics include: Geometric Dimensioning and Tolerancing, 3D models, welding symbols, advanced visualization, design modeling of parts and assemblies, feature based design. Use of AutoCAD and parametric modeling software.

TSM 240. Introduction to Manufacturing Processes. (1-4) Cr. 3. F.S. A study of selected materials and related processes used in manufacturing. Lecture and laboratory activities focus on materials, properties, and processes. This includes plastics and metals.

TSM 270. Principles of Injury Prevention. (3-0) Cr. 3. F. Basic foundations of injury causation and prevention in home, motor vehicle, public, and work environments.

TSM 310. Total Quality Improvement. (3-0) Cr. 3. S. Prereq: STAT 101 or STAT 104, junior classification. Introduction to the fundamental concepts of TQM - Deming style of management, statistical studies to understand the behavior of products, processes, or services, and how to define and document processes and customer focus. Introduction to continuous improvement tools and methods - DMAIC, SPC, and Lean, Six Sigma, and JIT; emphasis on team work and problem solving skills.

TSM 322. Preservation of Grain Quality. (2-0) Cr. 2. S. Prereq: MATH 140 or higher. Principles and management for grain quality preservation. Quality measurement. Drying and storage. Fans and airflow through grain. Handling methods.


TSM 324. Soil and Water Conservation Management. (2-2) Cr. 3. S. Prereq: MATH 140 or MATH 160. Introduction to engineering and conservation principles applied to the planning of erosion control systems, water control structures, water quality management, and drainage and irrigation systems.

TSM 325. Biorenewable Systems. (Cross-listed with A E, AGRON, AN S, BSE, BUSAD, ECON). (3-0) Cr. 3. F. Prereq: ECON 101, CHEM 163 or higher, MATH 140 or higher. Converting biorenewable resources into bioenergy and biobased products. Biorenewable concepts as they relate to drivers of change, feedstock production, processes, products, co-products, economics, and transportation/logistics.


TSM 335. Tractor Power. (3-3) Cr. 4. F. Prereq: TSM 210, MATH 142. Theory and construction of tractor engines, mechanical power trains and hydraulic systems. Introduction to traction, chassis mechanics, and hydraulic power.


TSM 370. Occupational Safety. (3-0) Cr. 3. S. Prereq: TSM 270, junior standing. Identifies safety and health risks in industrial work environments. Focus on how managers and supervisors meet their responsibilities for providing a safe workplace for their employees. Includes the identification and remediation of workplace hazards. Nonmajor graduate credit.
Cr. 2.  F.S.  
Introduction to occupational safety and health administration and management. Focus on development and management of safety programs and obtaining employee involvement in occupational safety programs.

TSM 372. Legal Aspects of Occupational Safety and Health.  
Cr. 2.  Alt.  F., offered 2013.  Prereq: TSM 371  
A review of the common legal issues facing safety practitioners in the workplace. Includes OSHA, EPA and DOT regulations; workers’ compensation, as well as common liability issues.

Cr. 2.  Alt.  F., offered 2012.  
An overview of the current problems and technology in the fields of fire protection and fire prevention, with emphasis on industrial needs, focusing on the individual with industrial safety responsibilities.

TSM 393. Topics in Technology.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393A. Topics in Technology: Agriculture and Biosystems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393C. Topics in Technology: Manufacturing.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393D. Topics in Technology: Occupational Safety.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393E. Topics in Technology: Chemical Application Systems.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393F. Topics in Technology: Agricultural Safety and Health.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393G. Topics in Technology: Electronic Integration for Agriculture and Production Systems.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393I. Topics in Technology: Machinery Management Using Precision Agriculture Technology.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393N. Topics in Technology: Irrigation Systems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393Q. Topics in Technology: Irrigation Systems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393S. Topics in Technology: Irrigation Systems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393V. Topics in Technology: Irrigation Systems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 393X. Topics in Technology: Irrigation Systems Management.  
Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

Cr. 1-4.  F.S.S.S.  
Offered as demand warrants. Web-based instruction.

TSM 415. Technology Capstone I.  
Cr. 1-4.  F.S.  
Prereq: senior classification with less than 32 credits remaining. Identification and proposal development of a current technological problem in agricultural or industrial systems. Formation of project teams and selection of faculty project mentor in preparation to complete project.
Courses primarily for graduate students, open to qualified undergraduates:

TSM 540. Advanced Design and Manufacturing.
(3-0) Cr. 3. S. Prereq: Permission of instructor
Application of six sigma philosophy to advance product design and process control. Application of value steam mapping to the existing manufacturing system to develop future continuous improvement plans. Application of Taguchi Parameter design methodologies for optimizing the performance of manufacturing processes. Application of Taguchi Tolerance Design methodologies for product design.

(2-0) Cr. 2. Repeatable, maximum of 2 times.
Exploration and analysis of current safety and public health issues impacting society. The focus will be on topics that impact individuals in work, public, and home environments.

TSM 577. Risk Analysis and Management.
(Dual-listed with TSM 477). (3-0) Cr. 3. Alt. F., offered 2012. Prereq: MATH 160, STAT 101 or STAT 104
Risk analysis and management focuses on developing a risk oriented pattern of thinking that is appropriate for today’s complex world. The tools that will be gained in this course will be helpful in recognizing, understanding, and analyzing hazards and risks in modern complex systems.

TSM 590. Special Topics in Technology.
Cr. 1-4. Repeatable, maximum of 4 credits. Prereq: Graduate classification in industrial and agricultural technology, permission of instructor, and completion of an independent study contract approved by major professor

TSM 590A. Special Topics in Technology: Agriculture and Biosystems Management.
Cr. 1-4. Repeatable, maximum of 4 credits. Prereq: Graduate classification in industrial and agricultural technology, permission of instructor, and completion of an independent study contract approved by major professor

TSM 590B. Special Topics in Technology: Machine Systems.
Cr. 1-4. Repeatable, maximum of 4 credits. Prereq: Graduate classification in industrial and agricultural technology, permission of instructor, and completion of an independent study contract approved by major professor

TSM 590C. Special Topics in Technology: Manufacturing.
Cr. 1-4. Repeatable, maximum of 4 credits. Prereq: Graduate classification in industrial and agricultural technology, permission of instructor, and completion of an independent study contract approved by major professor

TSM 590D. Special Topics in Technology: Occupational Safety.
Cr. 1-4. Repeatable, maximum of 4 credits. Prereq: Graduate classification in industrial and agricultural technology, permission of instructor, and completion of an independent study contract approved by major professor

TSM 593. Workshop in Technology.
Cr. R. Prereq: Permission of instructor
A technical paper draft based on the M.S. thesis or creative component is required of all master’s students. This paper must be in a form that satisfies the requirements of some specific journal and be ready for submission. A technical presentation based on M.S. thesis or creative component is required of all master’s students. This presentation must be in a form that satisfies the normal presentation requirements of a professional society. The presentation itself (oral or poster) may be made at a professional society meeting or at any international, regional, state, or university conference/event as long as the presentation content and form conforms to normal expectations. Offered on a satisfactory-fail basis only.

TSM 599. Creative Component.
Cr. 1-3. Repeatable, maximum of 6 credits.
A discipline-related problem to be identified and completed under the direction of the program adviser. Three credits required for all nonthesis master’s degree students.

Courses for graduate students:

TSM 601. Graduate Seminar.
(Cross-listed with A E). (1-0) Cr. 1. F.
Keys to writing a good MS thesis or PhD dissertation. How to begin formulating research problems. Discussion of research problems and broader impacts, review of literature, identifying knowledge gaps and needs, long-term goals, research hypotheses, objectives, rationale and significance, methods, procedures, data analysis, and reporting results. Presentation of research proposal in different formats. Using peer review and responding to feedback.
TSM 652. Program and Learner Evaluation.
(3-0) Cr. 3. Prereq: STAT 401 or equivalent
Techniques for evaluating learners, facilities, programs, and staff utilizing theories for developing measurement instruments. Outcomes assessment is emphasized.

(3-0) Cr. 3. Prereq: Permission of instructor
A definition of the faculty role in technology and engineering disciplines, including strategies for dealing with programs, personnel, and constituencies are presented. Leadership skills involving team formation, team operation, and conflict resolution are addressed.

(3-0) Cr. 3. Prereq: Permission of instructor
Basic concepts, trends, practices, and factors influencing curriculum development, techniques, organization and procedures. Emphasis will be given to program and course development.

TSM 694. Teaching Practicum.
(Cross-listed with A E). Cr. 1-3. Repeatable. F.S.S.S. Prereq: Graduate classification and permission of instructor
Graduate student experience in the agricultural and biosystems engineering departmental teaching program.

TSM 697. Internship in Technology.
Cr. R. Prereq: permission of major professor and approval by department chair, graduate classification
One semester and one summer maximum per academic year professional work period. Offered on a satisfactory-fail basis only.

TSM 698. Technical Communications for a Doctoral Degree.
(Cross-listed with A E). Cr. 1. F.S.S.S.
A technical paper draft based on the dissertation is required of all Ph.D. students. This paper must be in a form that satisfies the requirements of some specific journal and be ready for submission. A technical presentation based on the dissertation is required of all Ph.D. students. This presentation must be in a form that satisfies the normal presentation requirements of a professional society. The presentation itself (oral or poster) may be made at a professional society meeting or at any international, regional, state, or university conference/event as long as the presentation content and form conforms to normal expectations. Offered on a satisfactory-fail basis only.

TSM 699. Research.
Cr. arr.