TECHNICAL SYSTEMS MANAGEMENT (TSM)

TSM Class Schedule (https://courses.illinois.edu/schedule/DEFAULT/TSM/)

Courses
TSM 100  Technical Systems in Agr  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/100/)
Examples, problems, discussions, and laboratory exercises pointing to present and potential engineering applications in agriculture; emphasis on power and machinery, soil and water control, electricity, and structures.

TSM 103  Agricultural Machinery and Technology  credit: 2 Hours. (https://courses.illinois.edu/schedule/terms/TSM/103/)
Provides an exploratory experience in modern agricultural machinery and technology. It covers the fundamentals of modern agriculture as a system including markets, plant and soil science, and operations. Agricultural machinery and its integration with advanced technologies will be introduced. Topics include seeders, combine harvesters, GPS and navigation, field robotics, remote sensing, and a global perspective of agricultural technology. Content is designed for any academic discipline or experience level.

TSM 130  Basics of CAD  credit: 1 Hour. (https://courses.illinois.edu/schedule/terms/TSM/130/)
Introduction to Computer Aided Drawing and Design (CAD). Application of two and three dimensional CAD tools in construction systems for creating project plans, structures and building floor plans with fixtures and layers representing electrical and plumbing configurations. Self-paced learning through on-line tutorials with instructor guidance.

TSM 132  Basics of Project Management  credit: 1 Hour. (https://courses.illinois.edu/schedule/terms/TSM/132/)
Covers the basic concepts of project management software. Students will learn introductory features of project management software and utilize these features to complete class projects.

TSM 199  Undergraduate Open Seminar  credit: 1 to 5 Hours. (https://courses.illinois.edu/schedule/terms/TSM/199/)
Open seminar or experimental course on a topic in technical systems management. May be repeated to a maximum of 12 hours.

TSM 232  Materials and Construction Sys  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/232/)
Selection, use, and maintenance of hand and power tools; shop safety; selection of building and roofing materials; concrete masonry construction; and site preparation. Includes laboratory. Priority is given to technical systems management majors.

TSM 233  Metallurgy & Welding Process  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/233/)
Selecting and using metal-arc, inert-gas, submerged arc, oxyacetylene welding and plasma cutting processes for construction and maintenance. Includes laboratory. Additional fees may apply. See Class Schedule.

TSM 234  Wiring, Motors and Control Sys  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/234/)
Selecting and using wiring materials, electric motors and controls in lighting, heating, ventilation, and materials handling problems. Includes laboratory. Prerequisite: TSM 100.

TSM 262  Off-Road Equipment Management  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/262/)
Performance, costs, application, selection, and replacement of off-road machinery and field implements; analysis of mechanized field operations. Includes laboratory.

TSM 293  Off-Campus Internship  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/293/)
Supervised off-campus experience in a field directly pertaining to technical systems management. May be repeated to a maximum of 6 hours. Prerequisite: Sophomore standing and consent of instructor.

TSM 295  Undergrad Research or Thesis  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/295/)
Individual research, special problems, thesis, development and/or design work under the supervision of an appropriate member of the faculty. May be repeated to a maximum of 12 hours. Prerequisite: Sophomore standing, cumulative GPA of 2.5 or above at the time the activity is arranged, and consent of instructor.

TSM 311  Humanity in the Food Web  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/311/)
The human food web is the complex network of technologies, environments, people, and social institutions that produce, processes, and distributes the world’s food supply. Students will study the food webs of the past, present, and future and will explore various human roles, including their own, in the global technology-environment-society-food system. Course topics include domestication, mechanization, urbanization, the green revolution, biotechnology, food safety, the environment, and appropriate technologies for developing countries. Additional fees may apply. See Class Schedule. This course satisfies the General Education Criteria for: Advanced Composition Humanities - Hist Phil

TSM 339  Optimization in Engineering Technology and Management  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/339/)
Covers foundational skills in applied data analysis with a primary focus on optimization. Concepts related to sensors and data will first be discussed followed by data acquisition and basic digital signal processing. Foundations of optimization will be introduced with an emphasis on application. This will include linear and non-linear, single and multiple objective, spatial, and stochastic optimization methods. Assignments will contain real world examples in the topic areas of agriculture, construction, manufacturing, and the environment. Prerequisite: MATH 234 or equivalent; ACE 262, CPSC 241, ECON 202 or equivalent, STAT 107; and CS 105 or equivalent, or consent of the instructor.

TSM 352  Land and Water Mgt Systems  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/352/)
Principles of planning, implementing and utilizing land and water practices for Illinois land uses, especially agriculture. Includes laboratory. Prerequisite: Completion of Quantitative Reasoning requirement.

TSM 363  Fluid Power Systems  credit: 2 Hours. (https://courses.illinois.edu/schedule/terms/TSM/363/)
Emphasizes basic principles of fluid power systems related to off-road vehicles. Topics include fundamentals of fluid power systems, principles of key fluid power components, and maintenance of fluid power systems. Credit is not given for both TSM 363 and ABE 223.
TSM 371  Residential Housing Design  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/371/](https://courses.illinois.edu/schedule/terms/TSM/371/))
Principles and practices in residential housing; space planning, house types, structures, materials, utilities, environmental control, energy conservation, remodeling, and economic influences. Includes laboratory.

TSM 372  Environ Control & HVAC Systems  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/372/](https://courses.illinois.edu/schedule/terms/TSM/372/))
Introduction to heating, ventilating, and air-conditioning (HVAC) systems for building environment control. Topics include: psychrometrics, basic calculation of heating and cooling loads, human comfort and ventilation requirements, typical HVAC and control systems.

TSM 381  Grain Drying & Storage Systems  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/381/](https://courses.illinois.edu/schedule/terms/TSM/381/))
Grain drying fundamentals, air-moisture relationships, grain drying systems for efficient energy use, fans, grain-handling devices and systems, planning of grain handling systems, grain standards, moisture measurement, grain storage, fungi and insect problems, aeration, processing and milling of corn and soybeans. Includes laboratory.

TSM 396  UG Honors Research or Thesis  credit: 1 to 4 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/396/](https://courses.illinois.edu/schedule/terms/TSM/396/))
Individual research, special problems, thesis, development and/or design work under the direction of the Honors advisor. May be repeated to a maximum of 12 hours. Prerequisite: Junior standing, admission to the ACES Honors Program, and consent of instructor.

TSM 421  Ag Safety-Injury Prevention  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/421/](https://courses.illinois.edu/schedule/terms/TSM/421/))
Issues associated with agricultural injuries and their prevention. Areas include: agricultural injury situation; injury causation; injury intervention strategies and their applications to agricultural issues; and, specific safety issues in the areas of farm machinery, grain and forage systems, animals, materials handling, electricity, fire safety, special populations, and emergency preparedness. Course Information:3 undergraduate hours. 3 graduate hours.

TSM 422  Ag Health-Illnesses Prevention  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/422/](https://courses.illinois.edu/schedule/terms/TSM/422/))
Overview of occupational illnesses and diseases in the agricultural industry and its practices. Hazards within agricultural production are examined and potential hazards to non-farm populations and those interacting with production personnel are explored. Agricultural industry practices are summarized and potential human health effects of specific practices identified. Specific preventative measures are outlined to reduce exposures and remediate exposure symptoms. Interaction with health/medical professionals is on-going during the semester to familiarize students with medical procedures pertinent to agricultural occupational medicine. 3 undergraduate hours. 3 graduate hours.

TSM 425  Managing Ag Safety Risk  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/425/](https://courses.illinois.edu/schedule/terms/TSM/425/))
Management aspects of farm and agriculturally related business safety and health. Topics include: orientation to farm and agricultural related business safety and health issues, legal and ethical responsibilities, liability issues, injury/illness incident investigation, agricultural safety and health resources, how to approach and organize a safety and health management plan, and safety and health worker education and training. Case study approach to devise a safety and health management plan for an existing farm or agricultural related business. Team work to emulate development of safety management programs in general industry. Student exposure through class discussion exercises to recent agricultural safety and health research studies conducted in North America and Europe. 3 undergraduate hours. 3 graduate hours. Prerequisite: Credit or concurrent registration in TSM 421 or TSM 422, or consent of instructor.

TSM 430  Project Management  credit: 2 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/430/](https://courses.illinois.edu/schedule/terms/TSM/430/))
Same as ABE 430. See ABE 430.

TSM 435  Elec Computer Ctrl Sys  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/435/](https://courses.illinois.edu/schedule/terms/TSM/435/))
Microcomputer and electrical control applications; electrical fundamentals; solid-state devices; relays; biosensors; motor types and characteristics; three-phase power; logic devices; analog/digital convertors; and interfacing for agricultural control applications. Includes laboratory. 3 undergraduate hours. 3 graduate hours.

TSM 438  RenewableEnergyApplications  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/438/](https://courses.illinois.edu/schedule/terms/TSM/438/))
Renewable energy sources and applications, including solar, geothermal, wind, and biomass. Environmental consequences of energy conversion including how renewable energy can reduce air pollution and global climate change. Economics of alternative energy systems. 3 undergraduate hours. 3 graduate hours. Credit is not given for both TSM 438 and ABE 436. Prerequisite: Junior, senior, or graduate standing required.

TSM 439  Capstone Experience  credit: 4 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/439/](https://courses.illinois.edu/schedule/terms/TSM/439/))
Develop solutions to real-world problems by demonstrating and enhancing students' abilities as problem solvers, project managers, team members, technical writers, and builders on multiple projects simultaneously. This will involve project planning and budgeting, prototype development and construction, testing, data collection and analysis, marketing, and navigating project challenges outside of students' control. 4 undergraduate hours. No graduate credit. Prerequisite: TSM 430. Restricted to TSM Majors Only, senior standing required, or consent of instructor.

TSM 464  Engine and Tractor Power  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/TSM/464/](https://courses.illinois.edu/schedule/terms/TSM/464/))
Construction, performance and maintenance of internal combustion engines, power trains, and hydraulic systems for off-road equipment; methods and equipment for performance testing; and weight transfer and traction. Includes laboratory. 3 undergraduate hours. 3 graduate hours. Credit is not given for both TSM 464 and ABE 466.
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TSM 465 Chemical Applications Systems  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/465/)
Hydraulic principles; liquid application systems including pumps, controls, and spray nozzles; granular application systems; safe storage, handling, and disposal of pesticides and fertilizers; federal and state legal requirements. Includes laboratory. 3 undergraduate hours. 3 graduate hours.

TSM 467 Precision Agric Technology  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/467/)
Practices and equipment used in precision agriculture. Global positioning systems; geographic information systems; mapping; grid sampling of soil fertility and physical properties; yield monitoring; remote sensing; variable-rate technologies. 3 undergraduate hours. 3 graduate hours.

TSM 486 Grain Bioprocessing Coproducts  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/486/)
Bioprocessing of cereals and oilseeds by milling, fermentation and extraction processes in the production of a wide variety of coproducts used in animal foods. Includes the effects of the process variables and bioprocess on coproduct quality and the post-processing of coproducts. 3 undergraduate hours. 3 graduate hours. Bioprocessing of cereals and oilseeds by milling, fermentation and extraction processes in the production of a wide variety of coproducts used in animal foods. Includes the effects of the process variables and bioprocess on coproduct quality and the post-processing of coproducts. Course Information: 3 undergraduate hours. 3 graduate hours. Credit is not be given for both TSM 486 and TSM 586.

TSM 496 Independent Study  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/496/)
Individual research, special problems, thesis, development and/or design work under the supervision of a faculty member. 1 to 4 undergraduate hours. 1 to 4 graduate hours. May be repeated to a maximum of 6 hours. Prerequisite: consent of instructor.

TSM 499 Seminar  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/499/)
Group discussion or an experimental course on a special topic in technical systems management. 1 to 4 undergraduate hours. 1 to 4 graduate hours. May be repeated in separate terms to a maximum of 12 hours.

TSM 501 Graduate Research I  credit: 1 Hour. (https://courses.illinois.edu/schedule/terms/TSM/501/)
First of a two-course sequence (with TSM 502) for graduate students in Technical Systems Management. Prepares students to perform successfully in a research environment and to develop skills in teaching. Topics to be covered include research methodology, teaching methods, lecture preparation and delivery, critical review of scientific articles, peer review and publishing, mentoring and peer relationships, time management, and intellectual property.

TSM 502 Graduate Research II  credit: 1 Hour. (https://courses.illinois.edu/schedule/terms/TSM/502/)
Second of a two-course sequence (with TSM 501) for graduate students in Technical Systems Management. Prepares students to perform successfully in a research environment and to develop skills in teaching. Topics to be covered include research methodology, teaching methods, lecture preparation and delivery, critical review of scientific articles, peer review and publishing, mentoring and peer relationships, time management, and intellectual property.

TSM 502 Advanced Bioprocess Coproducts  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/TSM/502/)
Bioprocessing of cereals and oilseeds by milling, fermentation and extraction processes in the production of a wide variety of coproducts used in animal foods. Includes the effects of the process variables and bioprocesses on coproduct quality and the post-processing of coproducts; also analysis of current literature and issues relating to coproducts. 3 graduate hours. No professional credit. Credit is not be given for both TSM 486 and 586. Prerequisite: Graduate standing or consent of instructor.

TSM 594 Graduate Seminar  credit: 0 Hours. (https://courses.illinois.edu/schedule/terms/TSM/594/)
Presentations of thesis research by graduate students; other presentations on teaching or current research issues related to technical systems management. Approved for S/U grading only. May be repeated to a maximum of six times.

TSM 596 Independent Study  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/596/)
Individual investigations or studies of any phases of technical systems management selected by the student and approved by the advisor and the faculty member who will supervise the study. May be repeated in the same or separate terms if topics vary to a maximum of 6 hours. Prerequisite: Consent of instructor.

TSM 598 Special Topics  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/TSM/598/)
Group discussion or an experimental course on a special topic in technical systems management. May be repeated in the same term to a maximum of 8 hours. May be repeated in separate terms to a maximum of 12 hours. Prerequisite: As specified for each topic offering; see Class Schedule or departmental course information.

TSM 599 Thesis Research  credit: 0 to 16 Hours. (https://courses.illinois.edu/schedule/terms/TSM/599/)
Individual research in the various areas of technical systems management under the supervision of faculty members. Approved for S/U grading only. May be repeated in separate terms.