

ETMA- ENGINEERING TECHNOLOGY & MANAGEMENT FOR AGRICULTURAL SYSTEMS

ETMA Class Schedule (<https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/ETMA/>)

Courses

ETMA 100 Technical Systems in Agr credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 103 Agricultural Machinery and Technology credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 130 Basics of CAD credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 132 Basics of Project Management credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 199 Undergraduate Open Seminar credit: 1 to 5 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/199/>)

Open seminar or experimental course on a topic in technical systems management. May be repeated to a maximum of 12 hours.

ETMA 232 Materials and Construction Sys credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 233 Metallurgy & Welding Processes credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 234 Wiring, Motors and Control Sys credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/234/>)

Selecting and using wiring materials, electric motors and controls in lighting, heating, ventilation, and materials handling problems. Includes laboratory. Prerequisite: ETMA 100.

ETMA 262 Agricultural Machine Systems Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/262/>)

Performance, costs, application, selection, and replacement of agricultural machinery and field implements; analysis of mechanized field operations. Includes laboratory.

ETMA 293 Off-Campus Internship credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/293/>)

Supervised off-campus experience in a field directly related to Engineering Technology and Management for Agricultural Systems. May be repeated to a maximum of 6 hours in separate terms. Prerequisite: Sophomore standing and consent of instructor.

ETMA 295 Undergrad Research or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/295/>)

Individual research, special problems, thesis, development and/or design work under the supervision of an appropriate member of the faculty. May be repeated if topics vary to a maximum of 6 hours in the same term and a maximum of 12 hours in separate terms. Prerequisite: Sophomore standing, cumulative GPA of 2.5 or above at the time the activity is arranged, and consent of instructor.

ETMA 311 Humanity in the Food Web credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/311/>)

The human food web is the complex network of technologies, environments, people, and social institutions that produces, 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

ETMA 339 Optimization in Engineering Technology and Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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, ECON 202, CPSC 241, or STAT 107; and CS 105 or equivalent; or consent of the instructor.

ETMA 352 Land and Water Mgt Systems credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 363 Fluid Power Systems credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 371 Residential Housing Design credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/371/>)
Principles and practices in residential housing; space planning, house types, structures, materials, utilities, environmental control, energy conservation, remodeling, and economic influences. Includes laboratory.

ETMA 372 Environ Control & HVAC Systems credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 381 Grain Drying & Storage Systems credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 396 UG Honors Research or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/396/>)
Individual research, special problems, thesis, development and/or design work under the direction of the Honors advisor. May be repeated if topics vary up to 6 hours in the same semesters, to a maximum of 12 hours in separate semesters. Prerequisite: Junior standing, admission to the ACES Honors Program, and consent of instructor.

ETMA 421 Industrial and Agricultural Safety-Injury Prevention credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/421/>)
Issues associated with industrial and agricultural injuries and effective interventions. Areas include: industrial and agricultural injury situations; injury causation; injury intervention strategies and their applications to agricultural and industrial issues; and, specific safety issues in the areas of machinery, grain and forage systems, animals, materials handling and storage, electricity, fire safety, special populations, and emergency preparedness. 3 undergraduate hours. 3 graduate hours.

ETMA 422 Industrial and Agricultural Occupational Illness Prevention credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/422/>)
Overview of occupational illnesses and diseases in general industry and agricultural as well as associated practices. Occupational health hazards within agricultural production and general industry are examined. Potential hazards to non-farm populations and those interacting with production personnel are also explored. Industry practices are summarized with a special focus on the agricultural industry. 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 and occupational medicine. 3 undergraduate hours. 3 graduate hours.

ETMA 425 Managing Industrial and Agricultural Safety Risks credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/425/>)
Primary elements of effective occupational safety and health management plans applicable to any work place including farms. Topics include: orientation to major agricultural and general industry safety and health issues, legal and ethical responsibilities, liability issues, injury/illness incident investigation, 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 and student team work to devise safety and health management plans for existing businesses or farms. 3 undergraduate hours. 3 graduate hours. Prerequisite: Credit or concurrent registration in ETMA 421 or ETMA 422, or consent of instructor.

ETMA 430 Project Management credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/430/>)
Same as ABE 430. See ABE 430.

ETMA 435 Elec Computer Ctrl Sys credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 438 Renewable Energy Applications credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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 ETMA 438 and ABE 436. Prerequisite: Restricted to Junior, Senior or Graduate students.

ETMA 439 Capstone Experience credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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: ETMA 430. Restricted to TSM and ETMA Majors Only, senior standing required, or consent of instructor.

ETMA 464 Heavy Equipment Powertrains credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/464/>)
Construction, performance and maintenance of internal combustion engines, power trains, and hydraulic systems for agricultural and construction equipment; methods and equipment for performance testing; and weight transfer and traction. Includes laboratory. 3 undergraduate hours. 3 graduate hours. Credit is not given toward graduation for both ETMA 464 and ABE 466.

ETMA 465 Chemical Applications Systems credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 467 Precision Agric Technology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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.

ETMA 486 Grain Bioprocessing Coproducts credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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. Credit is not given for both ETMA 486 and ETMA 586.

ETMA 496 Independent Study credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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 if topics vary to a maximum of 6 hours. Prerequisite: Consent of instructor.

ETMA 499 Seminar credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/499/>)

Group discussion or an experimental course on a special topic in engineering technology and management for agricultural systems. 1 to 4 undergraduate hours. 1 to 4 graduate hours. May be repeated in separate terms to a maximum of 12 hours.

ETMA 501 Graduate Research I credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/ETMA/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. 1 graduate hour. No professional credit.

ETMA 586 Advanced Bioprocess Coproducts credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/586/>)

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 given for both ETMA 486 and ETMA 586. Prerequisite: Graduate standing or consent of instructor.

ETMA 594 Graduate Seminar credit: 0 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/594/>)

Presentations of thesis research by graduate students; other presentations on teaching or current research issues related to technical systems management. 0 graduate hours. No professional credit. Approved for S/U grading only. May be repeated if topics vary, to a maximum of six times.

ETMA 596 Independent Study credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/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. 1 to 4 graduate hours. No professional credit. May be repeated if topics vary up to 4 hours in the same term to a maximum of 6 hours. Prerequisite: Consent of instructor.

ETMA 598 Special Topics credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/598/>)

Group discussion or an experimental course on a special topic in technical systems management. 1 to 4 graduate hours. No professional credit. May be repeated, if topics vary, in the same term or separate terms to a maximum of 12 hours. Prerequisite: As specified for each topic offering; see Class Schedule or departmental course information.

ETMA 599 Thesis Research credit: 0 to 16 Hours. (<https://courses.illinois.edu/schedule/terms/ETMA/599/>)

Individual research in the various areas of technical systems management under the supervision of faculty members. 0 to 16 graduate hours. No professional credit. Approved for S/U grading only. May be repeated, if topics vary, to a maximum of 45 hours.