

Engineering Technology (ET)

Courses

ET 101. Fundamentals of Engineering Technology. 2 Credits.

This course equips students with the tools to be a successful student and practicing engineering technologist. Topics covered include ethics, project management, team work, working with data, creating presentations, engineering design, and an understanding of the engineering technology profession.

P: None
Fall Only.

ET 103. Surveying. 3 Credits.

This course covers fundamental concepts and theory of engineering measurements; adjustment and use of instruments; computations; measurement of distance, difference in elevation, angles, and directions; and route and construction surveys. Applications of probability and statistical analysis of surveying are included.

P: MATH 104 or higher; Major in Environmental Engineering Tech
Fall Only.

ET 105. Fundamentals of Drawing. 3 Credits.

This course equips students with the computer aided design software tools such as AutoCAD to generate 2D engineering graphics, including engineering drawings, that meet industry standards.

P: MATH 101 with at least a C grade or WPT-MFND score >465 and WPT-AALG score >525, AND in Mechanical, Electrical, or Environmental Engineering Technology major or Electrical Engineering major or Electrical Engineering Principles Certificate
Fall and Spring.

ET 142. Introduction to Programming. 3 Credits.

This is an introductory course in computer programming using the C++ language. Topics covered include problem solving, algorithms, selected statements, repetition, arrays, functions, and sub-programs. Applications to electrical engineering technology are emphasized.

P: MATH 104 with a C or higher, and Electrical Engineering Technology major or Electrical Engineering major or Electrical Engineering Principles Certificate
Spring.

ET 198. First Year Seminar. 3 Credits.

First Year Seminar, topics vary.
Reserved for New Incoming Freshman.

ET 201. Introduction to Environmental Engineering. 3 Credits.

This course explores applications of environmental engineering in determining sustainable methods for reducing air and water pollution and managing and solid and hazardous waste. This includes sources of air and water pollution, health and environmental effects of pollution, and regulations governing pollution. Sources, disposal, regulations, and health and environmental effects of solid waste are also covered. The economic, social, and environmental aspects of sustainable solutions are considered.

Fall Only.

ET 203. Introduction to Water and Waste Water. 3 Credits.

This course provides an overview of water resources, drinking water standards, water quality characteristics, water pollutants, and storm water management. Sampling and laboratory instrument procedures are included with statistical analysis of data to complete lab reports.

P: CHEM 211 and CHEM 213 with a C or higher
Fall Only.

ET 206. Chemistry for Engineers. 4 Credits.

This course will provide engineering students with a background in important concepts and principles of chemistry. Emphasis will be on areas relevant for an engineering context with practical applications. In addition to the fundamental concepts of atomic structure, solutions, stoichiometry, kinetics, and enthalpy of reactions, the connections between chemistry, physics, and materials science will be investigated.

P: MATH 104 or concurrent enrollment or equivalent or WPT-MFND score >465 and WPT-AALG score >525, AND declared major in Mechanical Engineering, Mechanical Engineering Technology, Electrical Engineering, or Electrical Engineering Technology
Fall and Spring.

ET 207. Parametric Modeling. 2 Credits.

This course provides skills and knowledge to enhance computer-aided design and solid modeling concepts including; part modeling, assemblies, engineering drawings and sheet metal modeling. Also Introduces kinematics motion and finite element simulation concepts by using the SOLIDWORKS software.

P: MATH 101 with a C or higher OR WPT-MFND score >465 and WPT-AALG score >525, AND declared Mechanical Engineering ,or Mechanical Engineering Technology major, or Mechanical Engineering Principles Certificate
Fall and Spring.

ET 218. Fluid Mechanics. 3 Credits.

This course covers the theory of fluids including hydrostatics, hydrostatic forces, buoyancy and stability, Bernoulli's equation, pipe flow, open channel flow, drag and lift.

P: PHYSICS 103 with a C or higher OR PHYSICS 201 with a C or higher OR ENGR 213 with a C or higher, and declared major in Environmental Engineering Technology or Mechanical Engineering Technology
Spring.

ET 250. Continuous Signals and Linear Systems. 3 Credits.

This course provides an introduction to signals and systems analysis techniques for continuous-time signals and linear systems. Topics include continuous-time signals and linear systems definitions and properties as well as signal processing techniques and applications. Signals and systems representations and applications to circuit analysis will also be performed using MATLAB.

P: MATH 203 with a C or higher, and declared major in Electrical Engineering Technology
Fall Only.

ET 318. Fluid Power Systems. 3 Credits.

This course covers the concept of fluid power and introduces common hydraulic and pneumatic systems used in engineering applications. Design, analysis, operation, maintenance, and application of these fluid power systems are discussed. Topics also include fluid directional, flow and pressure control.

P: ET 218 with a C or higher
Fall Only.

ET 324. Motors and Drives. 3 Credits.

This course analyzes selection, set-up, and circuitry associated with AC and DC drives and motors. Topics include DC motor characteristics. AC induction, specialty machine performance and characteristics, stepper motors, servomotors, and three phase power systems are also included.

P: ENGR 308 with a C or higher, and declared major in Mechanical Engineering Technology
Spring.

ET 330. Hydrology. 3 Credits.

Study of the principal elements of the water cycle, including precipitation, runoff, infiltration, evapotranspiration and ground water; applications to water resource projects such as low flow augmentation, flow reregulation, irrigation, public and industrial water supply and flood control.

P: MATH 104 with at least a C or higher math course
Fall Only.

ET 331. Advanced Water and Waste Water Treatment. 3 Credits.

Water and waste water treatment systems, including both sewage and potable water treatment plants and their associated collection and distribution systems. Study of the unit operations, physical, chemical and biological, used in both systems.

P: ET 203
Spring Even.

ET 334. Solid Waste Management. 3 Credits.

This course will focus on technical concepts of solid waste management related to the design and operation of landfills, waste-to-energy systems, composting facilities, recycling facilities, and other emerging waste management technologies.

P: ET 201
Spring Even.

ET 340. Advanced Programmable Logic Controllers. 3 Credits.

This course covers interfacing programmable logic controllers to communicate with each other in a complete system. Actuators used in typical industrial related processes are explored. Operation and application of electronic instrumentation and control systems are also covered.

P: ENGR 328 with a C or higher, and ENGR 329 with a C or higher
Fall Only.

ET 342. Supervisory Control and Data Acquisition. 3 Credits.

This course uses knowledge acquired from previous courses including embedded controllers and electrical circuit design as it applies to techniques for precision measurements, interpreting measurement data, and using it to control systems. Hands on laboratory experiments are provided to demonstrate and verify the concepts in precision measurement theory as it relates to process measurements and the accuracy of electrical measurements in industry.

P: ENGR 328 with a C or higher
Fall Only.

ET 350. Data Communication and Protocols. 3 Credits.

Concepts needed to understand data, communications, and networking are presented in this course. The principles associated with data communication, transmission media, interfaces, error control, flow control, synchronization, circuit switching, and packet switching are investigated.

P: ET 250 with a C or higher
Spring.

ET 360. Project Management. 3 Credits.

This course presents an overview of project management with an emphasis on engineering projects. Topics include pre-construction planning, project scheduling systems, critical path management, risk and effects analysis, and failure models.

P: Junior standing and either Electrical, Environmental, or Mechanical Engineering Technology major OR junior standing and Mechanical, or Electrical Engineering major

Fall and Spring.

ET 380. Industrial Automation Control. 3 Credits.

This course provides exposure to the technology of automation and control for both discrete and continuous manufacturing industries; architecture of industrial automation systems; introduction to automatic control; fundamentals and programming principles of programmable logic controllers (PLC) and relay logic controllers (RLL).

P: ENGR 216 with a C or higher, and ENGR 308 with a C or higher

Fall Only.

ET 385. Robotics. 3 Credits.

This course introduces the fundamentals of robotics, transformation of coordinate frame, kinematics, dynamic modeling, trajectory generation and control of robots. Will involve robot simulations using MATLAB/Simulink.

P: ENGR 204 with a C or higher, and ENGR 214 with a C or higher

Fall Only.

ET 390. Mechatronics. 3 Credits.

This course provides the knowledge and skills for the design and development of mechanical systems that utilize microcontrollers (dedicated control computers) in order to achieve performance that is not possible with purely mechanical systems, for example: feedback control, automatic acquisition of performance data, adaptive behavior, and interacting with operators (user interface). Students will gain lab-based, hands-on exposure to the design of mechatronic systems including: real-time programming of a microcontroller; selecting sensors and actuators and interfacing them to a microcontroller; and the development and testing of an actual mechatronic system. In addition, students will gain an appreciation for key aspects of mechatronic systems including: sampling rates, noise, interrupts, open and closed-loop control, system integration, and the importance of good documentation.

P: ENGR 204 with a C or higher, and ENGR 308 with a C or higher

Spring.

ET 391. GIS. 3 Credits.

This course provides an introduction to Geographic Information Systems and the utilization of spatial data for solving geographic problems. Both theoretical concepts of GIS technology and practical applications of GIS will be studied.

P: ET 101 and ET 105 both with a grade of C or higher

Fall Only.

ET 400. Co-op/Internship in Engineering Technology. 3 Credits.

Co-ops/internships are offered on an individual basis and consist of a program of learning activities planned in consultation with a faculty member and an industry sponsor. A student may also conduct research with sponsorship of an individual faculty member. Course is not repeatable for credit.

P: junior or senior standing; Major in Electrical, Environmental or Mechanical Engineering Tech

Fall and Spring.

ET 405. Applied Thermodynamics. 3 Credits.

This course provides senior level students with an overview of applied thermodynamics. Students will apply basic thermodynamics laws to analyze different cycles and systems, including: Vapor power cycles; Gas power cycles; Internal combustion engines; Refrigeration cycles and air conditioning systems; Combined heat and power (CHP) systems; Waste heat recovery technologies, especially organic Rankine cycles.

P: ENGR 324 with a C or higher

Spring.

ET 410. Capstone Project. 3 Credits.

In this class students form teams and define a technological problem with specifications. After developing project proposals, teams work toward solutions while applying principles of technical design from the curriculum. Each team will deliver a formal presentation and each student will provide a written report upon completion.

P: Senior standing in Environmental Engineering Technology or Electrical Engineering Technology or Mechanical Engineering Technology

Spring.

ET 415. Solar and Alternate Energy Systems. 3 Credits.

Study of alternate energy systems which may be the important energy sources in the future, such as solar, wind, biomass, fusion, ocean thermal, fuel cells and magneto hydrodynamics.

P: PHYSICS 104 with a C or higher OR PHYSICS 202 with a C or higher OR ENGR 210 with a C or higher or ENGR 308 with a C or higher

Spring.

ET 420. Lean Processes. 3 Credits.

This course focuses on the time value of money as well as operating a business using lean manufacturing with the Six Sigma and other operational models. Topics covered include decisions under risk, best alternative using economic models, present worth analysis, rate of return, and cost benefit analysis.

P: ET 101, ET 360 or concurrent enrollment; Major in Environmental Engineering Tech.

ET 424. Hazardous and Toxic Materials. 3 Credits.

The handling, processing, and disposal of materials which have physical, chemical, and biological properties that present hazards to human, animal, and plant life; procedures for worker safety and for compliance with regulations. The metals and nonmetals, carcinogens, radioactive materials, and pathogenic human, animal, and plant wastes.

P: CHEM 212

Spring Odd.

ET 430. Sustainable Agricultural Management. 4 Credits.

Quantitative study of runoff and sediment transport on agricultural lands. Engineering of structural and non-structural practices used in the management of water, soil, and nutrients on agricultural lands. Student will get acquainted with the practices used on agricultural landscapes to insure the quantitative and qualitative sustainability of soil and water resources, and will acquire the skills needed to engineer these practices through hands-on design approaches.

P: MATH 104 with a C or higher and ENV SCI 320 with a C or higher or Graduate status

Spring Odd.

ET 464. Atmospheric Pollution and Abatement. 3 Credits.

This course will provide students an understanding of atmospheric processes and weather patterns and how they affect pollutant transport. Sources, sinks, environmental effects, and abatement technologies for air pollutants will be addressed. Atmospheric reactions that create pollution or deplete stratospheric ozone will be included.

P: CHEM 212 and CHEM 214 and ET 201

Fall Odd.

ET 495. Teaching Assistantship. 1-6 Credits.

The student and supervising teacher must prepare a statement that identifies the course with which the assistantship will happen, objectives for the assistantship, and expectations in order to fulfill the course objectives. Students are not eligible to receive credit in both the course they assist the instructor with and the teaching assistantship in the same semester. Typically student has previously taken the course prior to enrollment in the assistantship. Course is repeatable for credit.

Fall and Spring.

ET 497. Internship. 1-12 Credits.

Supervised practical experience in an organization or activity appropriate to a student's career and educational interests. Internships are supervised by faculty members and require periodic student/faculty meetings. Course is repeatable for credit.

ET 498. Independent Study. 1-4 Credits.

Independent study is offered on an individual basis at the student's request and consists of a program of learning activities planned in consultation with a faculty member. A student wishing to study or conduct research in an area not represented in available scheduled courses should develop a preliminary proposal and seek the sponsorship of a faculty member. The student's advisor can direct him or her to instructors with appropriate interests. A written report or equivalent is required for evaluation, and a short title describing the program must be sent early in the semester to the registrar for entry on the student's transcript. Course is repeatable for credit.

P: fr or so st with cum gpa > or = 2.50; or jr or sr st with cum gpa > or = 2.00.