

ET - ENGINEERING TECHNOLOGY

ET 1500 Engineering Technology Trades Internship Cr. 1-6

Industrial practice dealing with specific skill trades in engineering technology, under supervision in cooperative internship program. Offered Irregularly.

ET 2140 Computer Graphics Cr. 3

Solution of drafting problems and development of graphic presentations using computer-assisted drafting techniques. Use of programming techniques for direct solution of drafting/graphic problems and available software routines. Introduction to the use of computer plotters, CRTs, digitizers. Offered Fall, Winter.

Prerequisites: CSC 1050 with a minimum grade of C-
Course Material Fees: \$15

ET 2160 Computer Applications for Engineering Technology Cr. 2

Various software programming environments and programming skills for engineering technology applications, including programming logic, file IO, data acquisition and processing, computer simulation, and communication protocols. Offered Fall, Winter.

Prerequisites: EET 2000 with a minimum grade of C- or ET 2140 with a minimum grade of C-

Restriction(s): Enrollment is limited to Undergraduate level students.

ET 2200 Engineering Materials Cr. 3

Application and characteristics, both physical and chemical, of metallic and nonmetallic materials, polymers, and composites used in industry. The primary process involved in producing these materials. Offered Yearly.

Prerequisites: CHM 1020 with a minimum grade of C-

ET 2500 Co-op Experience Cr. 1-4

Industrial practice under supervision in cooperative education. Work-study program. Report required. Offered Every Term.

Repeatable for 4 Credits

ET 3030 Statics Cr. 3

The objective of this course is to provide the student with a basic understanding of the analytical and graphical techniques that are used to determine the forces acting upon and within a body or structural component under static load. This course provides the necessary foundation for later studies in the analysis and design of structures as well as mechanical and electrical equipment. Offered Fall, Winter.

Prerequisite: ET 2140 with a minimum grade of C- and PHY 2130 with a minimum grade of C- and ET 3430 (may be taken concurrently) with a minimum grade of C-

ET 3050 Dynamics Cr. 3

Kinematics; kinetics of particles; kinetics of translation and rotation of a rigid body; relative motion; use of equations of plane motion. Application of impulse and momentum principles; work and efficiency. Offered Yearly.

Prerequisites: ET 3030 with a minimum grade of C- and MAT 3430 with a minimum grade of C-

ET 3430 Applied Differential and Integral Calculus Cr. 4

Limits, derivatives, applications of derivatives, definite integrals and their applications, and trigonometric functions. No degree credit in College of Liberal Arts and Sciences. Offered Every Term.

Prerequisites: MAT 1800 with a minimum grade of C-
Equivalent: MAT 3430

ET 3450 Applied Calculus and Differential Equations Cr. 4

Continuation of MAT/ET 3430, including logarithmic and exponential functions, first and second order ordinary differential equations, vectors, polar coordinates, Laplace transforms, Taylor series, and Fourier series. No degree credit in College of Liberal Arts and Sciences. Offered Every Term.

Prerequisites: ET 3430 with a minimum grade of C- or MAT 3430 with a minimum grade of C-

Equivalent: MAT 3450

ET 3850 Reliability and Engineering Statistics Cr. 3

Probability, hypergeometric, binomial, Poisson, and normal probability distribution; confidence intervals; inferences concerning means; linear regression; introduction to statistical quality control and reliability; use of computers. Offered Fall, Winter.

Prerequisites: MAT 1800 with a minimum grade of C-

ET 3870 Engineering Economic Analysis Cr. 3

Techniques to economically evaluate major technical projects, rate of return and present worth, interest formulae, federal taxes, risk, inflation, and non-economic constraints. Offered Every Term.

Prerequisites: MAT 1800 with a minimum grade of C-

ET 4990 Guided Study Cr. 1-6

Supervised study and instruction in field selected by student. Offered Irregularly.

Repeatable for 6 Credits

ET 4999 Senior Project Cr. 3

Satisfies General Education Requirement: Writing Intensive Competency Student designs, builds, and tests product; philosophy of design. Project proposal to be submitted by second week, final outcome to be completed by thirteenth week; progress reports, and oral presentation required. Offered Fall, Winter.

Prerequisites: ENG 3050 with a minimum grade of C

ET 5100 Fundamentals of Mechatronics and Industrial Applications Cr. 3

Fundamentals of mechatronics and their applications in industry; building blocks of mechatronic products including sensors, proximity, displacement and rotational measurement sensors, force and torque measurement sensors, pressure sensors, accelerometers, and actuators; introduction of closed-loop control, electrohydraulic motion control, PLC mechatronics design by embedding sensors, actuators and controllers into mechanical components. Offered Winter.

Prerequisites: EET 3180 with a minimum grade of C- or MCT 3010 with a minimum grade of C-

ET 5110 Advanced Programmable Controllers and Industrial Applications Cr. 3

Introduces basic concepts and architecture of industrial control systems, sensors, measurement devices, PID controllers, and operating principles of PLCs. Students will learn how to operate the PLC programming software. Ladder logic programs are the main language, and functions and function blocks will also be taught for students to grasp high-level PLC-programming skills. Offered Fall, Winter.

Prerequisite: EET 3720 with a minimum grade of C-

ET 5500 Graduate Industrial Internship Cr. 1-4

Industrial practice under supervision in cooperative education. Oral presentation and written report describing professional experience required. Offered for graduate credit only. Offered Every Term.

Restriction(s): Enrollment is limited to Graduate level students.

Repeatable for 4 Credits

ET 5800 Industrial Robots Programming Cr. 3

Introduces basic robotic theory (direct kinematics, inverse kinematics, links, joints, coordinates systems, and robotic vision theory). Students will learn how to program and operate industrial robots and apply the components of a vision system. Offered Fall.

ET 5870 Engineering Project Management Cr. 3

Insights into human and organizational behavior affecting products; quantitative tools for successful management of engineering projects. A variety of product types are addressed. How to select, initiate, operate and control as well as terminate a project. Offered Fall, Winter.
Prerequisites: MAT 1800 with a minimum grade of C-

ET 5995 Special Topics in Engineering Technology I Cr. 1-4

Topics to be announced in Schedule of Classes. Offered Irregularly.
Repeatable for 8 Credits

ET 7300 Advanced Battery Systems for Electric-drive Vehicles Cr. 4

Aims to familiarize students with advanced battery technologies and their applications in hybrid and electric vehicles. Contents include: a descriptive overview of energy sources and conversions, HEV/PHEV/EV technology, hybrid powertrain configuration and components, in-vehicle energy storage systems, electrochemistry fundamentals, battery power and capacity/energy, battery system design (cell, module and pack), Battery Management System (BMS), cell monitoring and balancing, thermal management, on-board diagnostics, battery charging schemes and systems. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.
Equivalent: EVE 7300

ET 7430 Methods of Engineering Analysis I Cr. 4

Applications of differential equations, partial derivatives, Laplace transforms, Fourier series, matrices, vectors. Offered Fall, Winter.
Restriction(s): Enrollment is limited to Graduate level students.

ET 7450 Methods of Engineering Analysis II Cr. 4

Computer applications and numerical methods of solving differential and integral equations, fast Fourier transforms, spectrum analysis, curve fitting, approximation of function. Offered Winter.
Prerequisite: ET 7430 (may be taken concurrently) with a minimum grade of C
Restriction(s): Enrollment is limited to Graduate level students.

ET 7800 Industrial Robots Dynamics and Control Cr. 3

Topics include: the direct and inverse dynamic problem for industrial robots; actuator and sensor dynamics; control of robot manipulators (PID control, design of control systems in state-space and computed torque technique); and current trends and research in industrial robotics. Offered Winter.
Prerequisite: ET 5700 with a minimum grade of C or ET 5800 with a minimum grade of C
Restriction(s): Enrollment is limited to Graduate level students.

ET 7850 Statistical Methods and Applications Cr. 4

Sampling techniques in production data analysis, correlation coefficients, regression analysis, control charts, design of experiments, analysis of variance, Factor analysis. Offered Winter.
Corequisite: ET 7430
Restriction(s): Enrollment is limited to Graduate level students.

ET 7990 Directed Study Cr. 1-8

Supervised study and instruction in an advanced topic. Outline of proposed study and petition must be submitted to graduate committee in advance of registration for approval. Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 8 Credits

ET 7995 Special Topics in Engineering Technology II Cr. 1-4

Topics to be announced in Schedule of Classes. Offered Irregularly.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 8 Credits

ET 7999 Master's Project Cr. 1-6

Design, fabrication, system optimization, and applications of graduate level material. Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students; enrollment limited to students with a class of Candidate Masters.
Repeatable for 6 Credits