

# ENGINEERING TECHNOLOGY (ETEC)

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## **ETEC 1010. Engineering Foundations. 1-2 Hours.**

This course focuses on leadership and study skills necessary for succeeding in the many career options available to professionals in industrial technology, business, and engineering education. Variable Credit (1 to 2).

## **ETEC 1371. Descriptive Geometry. 3 Hours.**

This course emphasizes problems of space relations of points, lines, surfaces, intersections, and developed surfaces, and their application to the graphical solution of engineering problems.

## **ETEC 2382. Manufacturing Processes. 3 Hours.**

Students examine a broad range of manufacturing processes with an emphasis on understanding manufacturing procedures and changes of physical properties of material during these processes. Topics may include forming and shaping processes, material removal processes, joining processes, casting and solidification processes, engineering metrology and instrumentation, and other aspects of manufacturing.

## **ETEC 2396. Special Topic. 3 Hours.**

This course of faculty-led study is designed to provide exposure of undergraduate students to new engineering technology topics and concepts in a course setting. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** ETEC 1010.

## **ETEC 3300. Technology Innovations. 3 Hours.**

This course provides a study of societal technologies and their effects on the daily lives of consumers. The course presents the pervasive nature of technology innovations and increases the awareness of the promises of uncertainty associated with the use of technology as a human enterprise.

**Prerequisite:** ETEC 1010 and Sophomore standing.

## **ETEC 3340. Solar and Wind Energy Systems. 3 Hours.**

This course will examine grid-connected and stand-alone solar photovoltaic and wind energy systems. System components including batteries, PV modules, charge controllers, maximum power point trackers, vertical and horizontal axis turbines, aerodynamics of wind turbines, wind farms and sighting, and inverters will be discussed. A comprehensive review of power production methods from solar and wind resources will be included, along with site surveying, commercial development, economics and environmental impacts.

**Prerequisite:** ETEE 1340 and Junior Standing.

## **ETEC 3360. Related Sci Mth & Tech In Occ. 3 Hours.**

This is the written portion of an 18-hour segment of proficiency examinations. Consent of department chair.

**Prerequisite:** Sophomore standing.

## **ETEC 3361. Related Science, Mathematics, and Technology in Occupations. 3 Hours.**

This is the written portion of an 18-hour segment of proficiency examinations.

**Prerequisite:** Consent of department chair.

## **ETEC 3362. Manipulative Skills In Occupatn. 3 Hours.**

This segment is for the manipulative portion of the proficiency examination. Consent of department chair.

**Prerequisite:** Sophomore standing.

## **ETEC 3363. Manipulative Skills in Occupations. 3 Hours.**

This segment is for the manipulative portion of the proficiency examination.

**Prerequisite:** Consent of department chair.

## **ETEC 3364. Rel Subj In Occupatnl Pers Qual. 3 Hours.**

This is the oral portion of the proficiency examination. Consent of department chair.

**Prerequisite:** Sophomore standing.

## **ETEC 3365. Related Subjects in Occupations and Personal Qualifications. 3 Hours.**

This is the oral portion of the proficiency examination.

**Prerequisite:** Consent of department chair.

## **ETEC 3367. Engineering Materials Techn. 3 Hours.**

This course consists of the principles and techniques involved in designing and drawing machine parts and other items normally required in an industrial setting. Topics include sectioning, dimensioning, view rotation, symbols, legends, developments, and blueprint details. Junior standing.

**Prerequisite:** ETDD 1390 or ETEC 1361.

## **ETEC 3374. Time And Motion Study. 3 Hours.**

A study of the principles of motion economy, work measurement and improvement of production methods as they apply to modern industry. Attention is given to human relations, work simplification, and selected charting procedures.

**Prerequisite:** Sophomore standing.

**ETEC 3375. Statics. 3 Hours.**

This course examines qualitative and quantitative treatments of forces and moments. Designing trusses, constructing free body diagrams, and performing equilibrium analysis for coplanar systems are included.

**Prerequisite:** PHYS 1301, PHYS 1101, and MATH 1316 or MATH 1430 or MATH 2399.

**ETEC 3376. Microcontroller Applications. 3 Hours.**

This course introduces microcontroller architecture and microcomputer systems, including memory and input/output interfacing. Topics include low-level language programming, bus architecture, I/O systems, interrupts, and other related topics. The functional and technological characteristics of microcontroller structures, memory components, peripheral support devices, and interface logic will be examined. Various hardware configurations and interfacing techniques will be discussed.

**Prerequisite:** ETEE 1340 and ETEE 2320 and Junior Standing or Consent of Instructor.

**ETEC 4096. Directed Study. 1-6 Hours.**

Arranged professional and developmental learning experiences incorporating a practical application of engineering technology skills and practices. To include internships, individual research and industry studies. Variable Credit (1-6).

**Prerequisite:** Sophomore standing.

**ETEC 4099. Engineering Innovation. 1-3 Hours.**

In this course, students work closely with faculty to design, develop, and implement innovative engineering projects as part of their capstone experience. Variable credit 1-3.

**Prerequisite:** Faculty Approval.

**ETEC 4340. Alternative Energy Technology. 3 Hours.**

This course examines existing and potential ambient alternative energy sources, production capacities, energy harvesting, conversion, and storage techniques. The course will also examine fundamental concepts, terminology, definitions, and nomenclature common to all energy systems.

**Prerequisite:** ETEE 1340.

**ETEC 4350. Utilities Project Management. 3 Hours.**

Students examine key energy and industry utility competencies including project management, bidding and negotiation, technical job execution, and safety management. This class is designed to immerse students into the field of Engineering, Procurement, and Construction (EPC), through real projects from the industry.

**Prerequisite:** Junior standing and consent of instructor.

**ETEC 4369. Spec Topics in Industrial Tech. 3 Hours.**

Individual study in specialized areas of Industrial Technology. To be directed and approved by the Industrial Technology advisor. This course is designed to be a multitopic course. The student can take the course under various special topics being offered. Sophomore standing.

**Prerequisite:** Approval of faculty, program coordinator and chair.

**ETEC 4376. Strength of Materials. 3 Hours.**

This course focuses on the analysis of stresses, strains, deflection, and deformation in bodies under the action of loads. Topics include statically indeterminate axially loaded members, thermal deformation, distribution of bending and shearing stresses in beams, stress and shear flow formulas, combined stresses and Mohr's circle, torsion on a circular shaft, empirical column formulas, and bolted joint failures.

**Prerequisite:** ETEC 3375.

**ETEC 4378. HVAC Systems. 3 Hours.**

Students study the concepts of heating, refrigeration, and air conditioning technology and associated systems. Topics may include heat transfer, controls, electric motors, refrigeration and air-conditioning, chilled-water systems, domestic and commercial Heating, Ventilation, and Air Conditioning (HVAC) systems. Hardware and equipment such as condensers, compressors, evaporators, and expansion devices, as well as safety, tools, equipment, and shop practices may also be discussed.

**ETEC 4384. Supervisory Personnel Practice. 3 Hours.**

This course introduces students to the principles of management as pertaining to personnel. Responsibilities of management, industrial economics, supervisory information, training, group dynamics, work simplification, labor and human relations, working conditions, morale, motivation, and mental health are covered.

**Prerequisite:** ETEC 1010 or Junior standing.

**ETEC 4390. Directed Studies. 3 Hours.**

Designed to provide students with the opportunity to gain specialized experience in one or more of the following areas: internship, laboratory procedures, individualized study, innovative curricula, workshops, specialized training schools, and seminars. Internship is required of all teacher education majors. May be repeated or taken concurrently to a maximum of 9 hours. Faculty, Program Coordinator and Chair approval required.

**Prerequisite:** Sophomore standing.

**ETEC 4391. Work Base Mentorship. 3 Hours.**

Students work in their specialization in the industry. Students may complete their internship in one or two semesters. Students must work 100 clock hours for 1 college credit. Faculty, Program Coordinator and Chair approval required.

**Prerequisite:** Junior standing.

**ETEC 4399. Senior Design. 3 Hours.**

Students learn advanced topics and gain hands-on skills in engineering technology fields while working in team environments. Topics and activities may include design and implementation processes, application of project management that culminates with analysis, drawings, installation or prototype, and testing of a significant project. Presentation and technical reports are required.

**Prerequisite:** Senior Standing.