

# ELECTRONICS TECHNOLOGY (ETEE)

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**ETEE 1340. Introduction to Circuits. 3 Hours. [TCCN: ENGT 1401]**

This course is designed to provide fundamental understanding of electronics in DC circuits. Emphasis is on knowledge and application of electrical safety, power generation, metering instruments and circuit analysis. Laboratory experiences include hands-on circuit construction and basic troubleshooting. Course Equivalents: ITEC 1340 .

**ETEE 2320. Circuits and Systems. 3 Hours. [TCCN: ENGT 1402]**

This course is an in-depth study of the electronic principles associated with AC circuits. Topics of study include network theorems, circuit analysis methods, resonance, filters and frequency responses of reactive circuits. Course Equivalents: ITEC 2320

**Prerequisite:** ETEE 1340 or consent of instructor.

**ETEE 2396. Special Topic. 3 Hours.**

This course of faculty-led study is designed to provide exposure of undergraduate students to new electrical and electronics 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 and ETEE 1340.

**ETEE 3313. Industrial Robotics. 3 Hours.**

Students learn and apply the knowledge of industrial robotics hardware and software to integrate automation in manufacturing. Laboratory experience includes hands-on programming of a robotic arm and various troubleshooting techniques. Completion of this course helps prepare students for a robotics certification.

**Prerequisite:** ETEE 1340 or Consent of Instructor.

**ETEE 3345. Digital Electronics. 3 Hours.**

This course is a study of the principles and applications of digital logic circuits including logic gates, counters, shift registers, and combinational logic circuits. Laboratory experiences consist of experimental problems. Course Equivalents: ETEE 4373, ITEC 4373

**Prerequisite:** ETEE 2320.

**ETEE 3350. Analog Electronics. 3 Hours.**

This course is designed to provide in-depth knowledge and experience in the principles and applications of solid-state devices. Specific emphasis is placed on the construction, characteristics and applications of diodes, rectifiers, transistors, thyristors and integrated circuits. Laboratory experience is gained through circuit construction, testing and troubleshooting. Course Equivalents: ITEC 2350

**Prerequisite:** ETEE 2320 or consent of instructor.

**ETEE 3360. Electrical Power & Machinery. 3 Hours.**

Students explore DC machines, single and three-phase AC machines, and the fundamentals of electrical power systems. Topics include single and three-phase synchronous and induction machines, power transformers, DC motors and generators, and smart-grid systems with distributed renewable energy.

**Prerequisite:** ETEE 1340, ETEE 2320, and MATH 1420.

**ETEE 3373. Control Systems Technology. 3 Hours.**

This course introduces the principles of control theory with an emphasis on linear control systems. Topics may include open-loop and closed-loop industrial control system, principles and operation of electrical switching, time and control devices, AC and DC motor controls, servomechanisms, transducers, instrument symbology, and industrial detection systems. Course Equivalents: ITEC 3373

**Prerequisite:** ETEE 2320 and MATH 1420.

**ETEE 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. Course Equivalents: ETEC 3376

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

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

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

**Prerequisite:** Sophomore standing.

**ETEE 4351. Automation and Programmable Logic Controllers (PLCs). 3 Hours.**

This course explores the concepts of automation, electrical control systems, and programmable logic controllers. Topics may include principles of control system operations, numbering systems as applied to electrical controls, types of programmable logic controllers and their operation, equipment interfacing, and ladder logic programs. Application-oriented laboratory experiments and design problems are used to enhance students' knowledge and skills.

**Prerequisite:** ETEE 3350 or Consent of Instructor.

**ETEE 4352. Instrumentation & Interfacing. 3 Hours.**

This course focuses on computer-aided instrumentation and interfacing. Topics include real-time industrial data acquisition hardware and software, sensors, signal conditioning, and the design of data acquisition systems using software tools.

**Prerequisite:** ETEE 1340, ETEE 2320, and ETEE 3350.

**ETEE 4355. Electronic & Digital Communication. 3 Hours.**

Students learn fundamental technologies and advanced concepts for electronic and digital communications. Topics include propagation, AM/FM modulation/demodulation, receivers/transmitters, antennas, digital coding, wire and wireless communications, and other related subjects.

**Prerequisite:** MATH 1420 and ETEE 3350.

**ETEE 4369. Special Topic. 3 Hours.**

This course of faculty-led study is designed to provide exposure of undergraduate students to new electrical and electronics 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, ETEE 1340, and Junior Standing.

**ETEE 4375. Digital VLSI Design and Field Programmable Gate Arrays. 3 Hours.**

Students design and build a digital system, such as a CMOS integrated circuit. Topics include CMOS transistor operation, manufacturing process for CMOS VLSI chips, implementation of logic gates in CMOS, specifically layout, design rules, and circuit families. Students also learn advanced digital circuit design techniques for analyzing and optimizing timing and power at the circuit level, synthesis, timing analysis, functional verification, design-for-test, and layout with the aid of CAD, and FPGA/VHDL tools.

**Prerequisite:** ETEE 3345 and ETEE 3350.