

ELECTRICAL ENGINEERING TECHNOLOGY

The electrical engineering technology (EET) curriculum provides preparation for outstanding career opportunities not only in the electronics industry itself, but also in many other areas in modern industry that depend upon electronics for control, communications or computation. Outstanding opportunities exist for graduates to work in diverse areas of electronics and computers.

The work of an electrical engineering technology graduate may range from assisting in the design and development of new equipment in the laboratory, applying modern microprocessors in the field, to the operation or supervision of production operations or field representatives.

The program offers the Bachelor of Science in Engineering Technology degree with a major in Electrical Engineering Technology. An option in computers is also available. To meet diverse needs, the program is laboratory-oriented and provides a strong foundation of specialized mathematics and science courses in applied electrical engineering and related technical areas, as well as courses in the area of communications, humanities and the social sciences.

Program Educational Objectives

OSU Electrical Engineering Technology graduates a few years after graduation will:

- Be employed in a technical or management position where the skills and knowledge of applied electrical engineering are utilized.
- Continue life-long learning and professional growth through participation and membership in professional organizations and/or through the continuation of professional studies.
- Work proactively and productively in teams and communicate effectively in written, oral and graphical forms.
- Successfully apply mathematical, analytical and technical expertise to industrial problems

Electrical Engineering Technology graduates can expect to obtain these student outcomes upon graduation:

- (a) an ability to select and apply the knowledge, techniques, skills and modern tools of the discipline to broadly-defined engineering technology activities;
- (b) an ability to select and apply a knowledge of mathematics, science, engineering and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
- (c) an ability to conduct standard tests and measurements; to conduct, analyze and interpret experiments; and to apply experimental results to improve processes;
- (d) an ability to design systems, components or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- (e) an ability to function effectively as a member or leader on a technical team;

(f) an ability to identify, analyze and solve broadly-defined engineering technology problems;

(g) an ability to apply written, oral and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

(h) an understanding of the need for and an ability to engage in self-directed continuing professional development;

(i) an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

(j) a knowledge of the impact of engineering technology solutions in a societal and global context;

(k) a commitment to quality, timeliness and continuous improvement;

(l) should have knowledge and hands-on competence in the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation and maintenance of electrical/electronic(s) systems;

(m) the applications of physics or chemistry to electrical/electronic(s) circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry;

(n) the ability to analyze, design and implement control systems, instrumentation systems, communications systems, computer systems or power systems;

(o) the ability to apply project management techniques to electrical/electronic(s) systems, and

(p) the ability to utilize statistics/probability, transform methods, discrete mathematics or applied differential equations in support of electrical/electronic(s) systems.

The Electrical Engineering Technology major provides graduates the ability to enter the many dynamic fields of the electrical engineering world. The demand for graduates having electronic and electrical engineering design and application skills remains important and relevant. Graduates of this program will be prepared for a wide range of opportunities for employment in an industry that requires considerable knowledge of the electrical engineering profession.

The Electrical Engineering Technology–Computer option curriculum provides the preparation for graduates to enter the growing field of computer hardware and software engineering. The demand for graduates having both computer hardware and software skills is quickly developing as the importance of automation, robotics and artificial intelligence is recognized. Graduates of this program will be prepared for these opportunities in industry that require considerable knowledge of both computer hardware and software engineering skills.

The Electrical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org>.

Courses

EET 1003 Introduction to Microcomputer Programming

Prerequisites: Concurrent enrollment in MATH 1513.

Description: Programming a microcomputer using a spreadsheet and in BASIC. Application of algorithms to solve defined problems and an introduction to the numerical limitations of small machines. Previously offered as ECT 1003.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 1104 Fundamentals of Electricity

Prerequisites: MATH 1513 and consent of department.

Description: Elementary principles of electricity covering basic electric units. Ohm's law, Kirchoff's law, circuit solutions, network solutions, magnetism, inductance and capacitance. Course previously offered as ECT 1104.

Credit hours: 4

Contact hours: Lecture: 3 Lab: 3

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 1244 Circuit Analysis I

Prerequisites: MATH 1613.

Description: Analysis of AC electric circuits. The use of network theorems and phasors, coupled circuits, resonance, filters, and power. Course previously offered as ECT 1244.

Credit hours: 4

Contact hours: Lecture: 3 Lab: 3

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 2303 Technical Programming

Prerequisites: EET 1104, MATH 1513 or completion of comparable engineering science courses.

Description: Introduction to machine programming using industrial standard languages, emphasis on problems from science and technology. Course previously offered as ECT 2303.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 2544 Pulse and Digital Techniques

Prerequisites: EET 1104.

Description: Electronic circuits used in digital control and computation. Pulse generation, Boolean algebra and logic circuits. Course previously offered as ECT 2544.

Credit hours: 4

Contact hours: Lecture: 3 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 2635 Solid State Devices and Circuits

Prerequisites: EET 1244, MATH 1613.

Description: Diodes, transistors, LSI linear devices; their operation and applications in electronic circuits. Course previously offered as ECT 2635.

Credit hours: 5

Contact hours: Lecture: 4 Lab: 3

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 3005 Electronics Analysis I

Prerequisites: EET 1104, EET 1244, EET 2544, EET 2635, MATH 1513, MATH 1613, or evaluated equivalent. Corequisite(s): MATH 2123

Description: Extensive use of mathematics in analyzing discrete, linear device, linear systems and non-linear circuits. Development of the analytic skills necessary for upper-division work. The use of basic calculus in circuit analysis. Must obtain a "C" or better before admission to other 3000 level EET courses. Intended for transfer and returning students. Enrollment by adviser consent.

Credit hours: 5

Contact hours: Lecture: 5

Levels: Undergraduate

Schedule types: Lecture

Department/School: Engineering Technology

EET 3104 Elements of Electricity and Electronics

Prerequisites: MATH 1513.

Description: Essentials of electricity, controls, and electronics for non-majors. No credit for EET majors. Course previously offered as ECT 3104.

Credit hours: 4

Contact hours: Lecture: 3 Lab: 3

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 3113 Circuit Analysis II

Prerequisites: EET 2635 and MATH 2133.

Description: Application of elementary switching functions and LaPlace transforms to electronic circuit analysis. Circuit analysis in the S-plane, transfer functions and the application of circuit analysis software. Course previously offered as ECT 3113.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Engineering Technology

EET 3124 Project Design and Fabrication

Prerequisites: EET 1244, EET 2544, EET 2635

Description: Methods of designing, analyzing and fabricating electronic circuits using standard software packages. Heat transfer characteristics and problem solutions are included. Course previously offered as ECT 3124.

Credit hours: 4

Contact hours: Lecture: 3 Lab: 3

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Engineering Technology

EET 3254 Microprocessors I**Prerequisites:** EET 2544.**Description:** An introduction to microcontrollers and their uses in embedded applications. Topics include system architecture, assembly language, structured programming, memory systems, user I/O, timers, peripherals, etc. Course previously offered as ECT 3254.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3264 Microprocessors II****Prerequisites:** EET 2544, EET 3254.**Description:** A continuation of EET 3254. Programming and interfacing of microcontrollers in embedded application, including interrupts, EEPROM, serial programming, interfacing, power management, algorithms, stepper motor control. Course previously offered as ECT 3264.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3354 Communication and Signal Processing****Prerequisites:** EET 1244, EET 2635, MATH 2133, GENT 3123.**Description:** Bandpass signaling principles and circuits. The Fourier transform; AM, SSB, FM, and PM signaling; binary modulated bandpass signaling (FSK and PSK); superheterodyne receiver; phase locked loop (PLL); modulators and mixers; frequency multiplication; special purpose IC's. Course previously offered as ECT 3354.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3363 Data Acquisition****Prerequisites:** EET 2544 and EET 2635.**Description:** Methods used to convert physical variables to digital signals and vice versa. Signal conditioning, digital-to-analog converters, analog-to-digital converters, sample-and-hold circuits, sensors, and transducers. The use of computers in data acquisition and signal processing. Course previously offered as ECT 3363.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3423 Applied Analysis for Technology****Prerequisites:** MATH 2133 or equivalent.**Description:** Applications of elements of matrix algebra, ordinary differential equations, Fourier series, and infinite series to problems in engineering technology. Previously offered as GENT 3123.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Engineering Technology**EET 3524 Advanced Logic Circuits****Prerequisites:** EET 2544.**Description:** Computer-based design, simulation and implementation of digital/mixed-signal systems using programmable logic, field programmable gate arrays, ASICs and system-on-chip technology.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3533 Introduction to Telecommunications****Prerequisites:** EET 2544, EET 2635, EET 3254.**Description:** Introductory course to the field of telecommunications. Study of the various technologies and how the application of these technologies work together to form functioning systems and networks.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 3713 Introduction to Electric Power Technology I****Prerequisites:** EET 1244 or EET 3104, PHYS 1214, MATH 2123 and MATH 2133.**Description:** Concurrent enrollment in MATH 2133 or equivalent coursework is acceptable. Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Engineering Technology**EET 3723 Introduction to Electric Power Technology II****Prerequisites:** EET 1244 or EET 3104, PHYS 1214, MATH 2123 and MATH 2133.**Description:** Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4050 Advanced Electronic Problems****Prerequisites:** Junior standing and consent of head of department.**Description:** Junior standing and consent of head of department. Special problems in the electronic area. Course previously offered as ECT 4050. Offered for variable credit, 1-4 credit hours, maximum of 4 credit hours.**Credit hours:** 1-4**Contact hours:** Other: 1**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Engineering Technology

EET 4314 Elements of Control**Prerequisites:** EET 3113, EET 3123, EET 3363, GENT 3123.**Description:** Principles of analog and digital control, with emphasis on the analysis of feedback control systems in their various conceptual configurations. Application of feedback control theory to the analysis and design of present day circuits and systems. Use of circuit analysis software. Course previously offered as ECT 4314.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 2**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4363 Digital Signal Processing****Prerequisites:** EET 3354, EET 3363.**Description:** Introduction to Digital Signal Process. Theoretical development of Fourier transforms, IIR and FIR filters. Significant Design and programming projects.**Credit hours:** 3**Contact hours:** Lecture: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Engineering Technology**EET 4514 Advanced Telecommunication Topics****Prerequisites:** EET 3533.**Description:** Study of data transmission techniques between digital electronic devices.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 2**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4523 Introduction to Telecommunications****Prerequisites:** EET 4514.**Description:** Study of the effective management of telecom systems. Topics such as traffic engineering, quality of service and associated design costs are examined.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4654 Microwave Techniques****Prerequisites:** EET 2635, EET 3354.**Description:** Study of topics pertaining to VHF behavior of circuits and systems. Transmission line theory: wave equations, SWR, impedance calculations and transformations, and lossy lines. Extensive use of the Smith chart to solve transmission line problems. Introduction to Maxwell's equations, with emphasis on steady state. Wave propagation in rectangular waveguides. Introduction to antennas. Modeling of transistors at VHF, UHF, and microwave frequencies. Design and analysis of transistor amplifiers at VHF using y and s parameters. Designing LC impedance matching networks. Previously offered as ECT 4654.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 3**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4833 Industrial Project Design I****Prerequisites:** 20 credit hours of upper-division electronics courses or consent of instructor.**Description:** Course mirrors the design process in industry. Topics covered are Design Team formation, Identify Objectives, define design specifications, write specifications, create a state of work and Gantt chart, create a project budget, perform a Preliminary Design Review, Design Prototype. Previously offered as EET 4832 and ECT 4832.**Credit hours:** 3**Contact hours:** Lecture: 1 Lab: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology**EET 4843 Industrial Project Design II****Prerequisites:** EET 4833.**Description:** Student continues in the project steps of Change Board Review, Critical Design Review, Developing & Writing Test Specs., Product Fabrication and Testing, Formal Technical Report Submission and Outcomes Assessment Exam.**Credit hours:** 3**Contact hours:** Lecture: 1 Lab: 6**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Engineering Technology

Undergraduate Programs

- Electrical Engineering Technology, BSET (<http://catalog.okstate.edu/engineering-architecture-technology/electrical-engineering-technology/bset>)
- Electrical Engineering Technology: Computer, BSET (<http://catalog.okstate.edu/engineering-architecture-technology/electrical-engineering-technology/computer-bset>)

Faculty

Brian Norton, MS, PE—Associate Professor and Program Coordinator

Associate Professor: Imad Abouzahr, PhD, PE**Assistant Professors:** Avimanyu Sahoo, PhD; Ellis C. Nuckolls, MS, PE