SIU Southern Illinois University
CARBONDALE

Table of Contents

Electrical Engineering Technology..... 1

Electrical Engineering Technology

Mission Statement

The mission of the School of Applied Engineering and Technology is to provide value to our stakeholders through innovation in applied engineering education.

Electrical Engineering Technology is part of the technological field that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the technician and the engineer at the end of the spectrum closest to the engineer.

Program Educational Objectives (PEOs)

The Electrical Engineering Technology program at Southern Illinois University Carbondale prepares students to attain the following objectives, 3 to 5 years after graduation:

1. Become productive professionals and successfully formulate cost-effective solutions to real-world problems that are fundamental to electrical/electronic systems and related fields.
2. Pursue life-long learning through professional development activities, advanced degrees, professional licensure or certifications.
3. Serve the public and improve the quality of life by acting in a professional, safe and ethical manner.
4. Continually seek higher-level tasks requiring independent thinking and judgment, and advance professionally with increased responsibility.
5. Successfully integrate and contribute to the success of multi-disciplinary teams.

The undergraduate program in electrical engineering technology is accredited by the Engineering Technology Accreditation Commission of ABET, www.abet.org. For each curriculum, a minimum of 30 hours in engineering technology courses must be taken in residence at Southern Illinois University Carbondale.

Bachelor of Science (B.S.) in Electrical Engineering Technology

The electrical engineering technology major is designed to prepare graduates who are capable of technical design and who can contribute to the development, production, testing, and installation of electrical and electronic devices, circuits, and systems. In addition, graduates are capable of participation in the planning and installation of power distribution systems and operating and maintaining complex electrical systems. Graduates of the program are employed in communications, power, electronics, sales, manufacturing, and other fields.

B.S. Electrical Engineering Technology Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements [1]	39

Degree Requirements		Credit Hours
Foundation Skills		13
	ENGL 101, ENGL 102	6
	Quantitative Reasoning (substitute Mathematics in major)	3
	CMST 101	3
	UNIV 101	1
Disciplinary Studies		23
	Fine Arts	3
	Human Health	2
	Humanities	6
	Science (substitute PHYS in major for 3 hours)	6
	Social Science	6
Multicultural/Diversity		3
Requirements for Major in Electrical Engineering Technology		(6)+81
PHYS 203A, PHYS 203B, PHYS 253A, PHYS 253B		(3)+5
MATH 111 or (MATH 108 and MATH 109), MATH 150, MATH 282		(3)+8
MGMT 202		3
ENGR 222 or CS 202 or ECE 222		2
EET 150, EET 238, EET 238L, EET 245, EET 245L, EET 304A, EET 304AL, EET 304B, EET 304BL, EET 332A, EET 332AL, EET 332B, EET 332BL, EET 403A, EET 403AL, EET 437A, EET 437AL, EET 437B, EET 437BL, EET 438A, EET 438AL, EET 438B, EET 438BL, EET 439, EET 439L, EET 440, EET 440L, EET 495A, EET 495B		56
Technical Electives		7
Total		120

[1] *Courses in parentheses will also apply towards 6 hours in the University Core Curriculum, making a total of 39.*

Capstone Option for Transfer Students

The Capstone Option is available in the electrical engineering technology major and is explained on the Capstone Option page. Students holding an Associate in Applied Science (A.A.S.) degree or equivalent certification with a minimum grade point average of 2.0 are qualified. For the electrical engineering technology major, the associate degree or equivalent certification should be in an electrical or electronics-related field. This option permits qualified students to fulfill their degree requirements by completing 60 semester hours of work approved by the Capstone advisor. Each individual's program of study may differ according to the previous academic work.

Electrical Engineering Technology Courses

EET150 - Introduction to Electrical Engineering Technology This laboratory course gives students instrumentation and construction skills. It covers CAD/CAM for electronics and instrumentation used to measure circuit values and generate signals. Students learn to identify components, analyze error, use units common to electrical measurement, and learn to design and build circuits. Students demonstrate skills by assembling, testing, and trouble-shooting an electronic kit. Prerequisite: MATH 111 or concurrent enrollment. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 2

EET209 - Manufacturing Process Laboratory (Same as IMAE 209) Laboratory experiments to familiarize the student with the theory and operation of manufacturing processes. Lab. Prerequisite: IMAE 208 or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET238 - Digital System Fundamentals This course studies fundamental digital concepts used in electronic design and application. The course covers traditional design approaches for combinational and sequential circuits. The course introduces contemporary approaches such as hardware design languages. Topics include logic gates, flip-flops, memory circuits, Karnaugh map, and VHDL/Verilog. Prerequisite: EET 150 or concurrent enrollment, MATH 111 or concurrent enrollment. Co-requisite: EET 238L. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET238L - Digital System Fundamentals Lab The course gives students practical experience in the design, construction and testing of combinational and sequential digital logic circuits. The course demonstrates the theory presented in the companion lecture course through practical applications and projects. Students use test instruments to measure logic levels and validate circuit operation. Parts kit required. Prerequisites: EET 150 or concurrent enrollment, MATH 111 or concurrent enrollment. Co-requisite: EET 238 or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET245 - Introductory Circuit Theory and Applications This course covers the fundamental theories of electric circuits. It covers symbols and diagrams that represent electric circuits and includes mathematical definitions and application of circuit components. Students analyze circuits using Ohm's and Kirchoff's Laws. The course introduces mathematical descriptions for alternating currents with practical examples. Prerequisites: MATH 111, EET 150 or equivalent. Co-requisite: EET 245L. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET245L - Introductory Circuit Theory and Applications Lab This course demonstrates the theoretical concepts presented in the companion lecture course. The course gives students experience in the measurement of resistance, ac current/voltage and dc current/voltage. Students gain experience using digital multimeters, function generators and oscilloscopes while they validate electrical theory. The course introduces circuit simulation software use. Students compare lab measurements to theoretical results and assess measurement errors. Prerequisites: MATH 111, EET 150 or equivalent. Co-requisite: EET 245 or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET258 - Work Experience Credit Credit granted for past work experience while employed in fields related to the student's educational objective. Credit is established by departmental evaluation. Restricted to Electrical Engineering Technology students or departmental approval required. Credit Hours: 2-30

EET259 - Occupational Credit For occupational credit earned at junior colleges and technical institutes. Credit is established by departmental evaluation. Restricted to Electrical Engineering Technology students or departmental approval required. Credit Hours: 2-60

EET304A - AC/DC Circuit Theory and Application DC network mesh and nodal analysis. The course covers Thevenin's theorems, Norton's theorems, superposition, delta-wye resistor transformations, maximum power transfer, phasor transforms and impedance concepts for AC analysis. The course covers frequency response of RC, RL, and RLC, resonant circuits. The course presents Bode plots of simple RC and RL filter circuits. Prerequisites: (EET 245 & EET 245L) or ECE 235 with a C or better. Co-requisite: EET 304AL. Credit Hours: 3

EET304AL - AC/DC Circuit Theory and Application Lab This course demonstrates advanced circuit theory concepts covered in the companion lecture course through circuit construction and measurement. The course covers experiments that validate circuit analysis laws. Students estimate circuit errors based on component tolerances and compare them to instrument readings by computing experimental error. The course introduces advanced use of test instruments and error analysis. Students use circuit simulation software to solve ac circuits and perform filter circuit analysis. Prerequisite: (EET 245 & EET 245L) or ECE 235 with a C or better. Corequisite: EET 304A or consent of instructor. Credit Hours: 1

EET304B - Network Theory and Application Course covers phasor transform methods for AC networks, dependent sources, source conversions, mesh and nodal analysis, AC bridges, superposition, Thevenin's theorem, Norton's theorem and delta-wye conversion. The course analyzes RC transient response and pulse characteristics. It presents and solves ideal OP AMP circuits. Fourier series theory for non-sinusoidal signals. Prerequisites: EET 304A, EET 304AL, MATH 150. Co-requisite: EET 304BL. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET304BL - Network Theory and Application Lab This course extends the use of circuit theory to AC systems and electronic applications. Students construct and test circuits that validate the circuit theorems in the companion lecture course. The course experiments include non-ideal components, AC bridge circuits, maximum power transfer and Fourier analysis. Students construct and test OP AMP circuits. The course introduces advanced circuit simulation methods for validating lab constructions. Prerequisites: EET 304A, EET 304AL, MATH 150. Co-requisite: EET 304B or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET332A - DC Motors, Generators and Energy Conversion Devices Course covers theory, application, and operation of DC motors and generators. It emphasizes testing and measurement of machine characteristics, parameters and efficiency and develops circuit models describing machine operation. The course covers analysis of industrial motor protection and control schemes. It introduces the science, application, and economics of DC power using photocells. Prerequisites: EET 304A & EET 304AL or concurrent enrollment. Co-requisite: EET 332AL. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET332AL - DC Motors, Generators and Energy Conversion Devices Lab This course provides practical experiences in the testing and measurement of DC motors and generators. The course introduces safety concepts for working with higher voltage levels. Students learn to use software tools to produce quality reports and plots that document machine tests. Students perform experiments that measure the performance of various types of DC machines. Students learn to measure machine efficiency, torque and speed for common motor connections. Students test generators to determine their performance. Students complete a short research paper on the current state of solar power conversion. Prerequisites: EET 304A & EET 304AL or concurrent enrollment. Co-requisite: EET 332A or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET332B - AC Electric Machines and Power Systems The theory and operation of AC machines and industrial power systems with emphasis on testing and measurement of machine characteristics,

parameters and efficiency. The course reviews basic AC circuit analysis and introduces three-phase circuit analysis. The course develops power transformer, AC motor, and AC generator models. Prerequisites: EET 304B & EET 304BL or concurrent enrollment. Co-requisite: EET 332BL. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET332BL - AC Electric Machines and Power Systems Lab This course provides practical experience in connecting, applying and testing of common AC machines. The course introduces three phase AC power systems. The course focuses on measurement and testing of three phase AC machines. Topics include active/reactive power measurement, power factor, motor speed/torque measurement, motor starting characteristics, machine efficiency, and alternator operation. Prerequisites: EET 304B & EET 304BL or concurrent enrollment. Co-requisite: EET 332B or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET358 - Work Experience Credit Credit granted for past work experience that is principally management and/or supervisory in nature. Students seeking credit must demonstrate an employment history in fields/areas related to the student's educational objective. Credit is established by departmental evaluation. Restricted to Electrical Engineering Technology students or departmental approval required. Credit Hours: 1-30

EET359 - Occupational Credit Credit will be awarded via program evaluation of upper-level non-accredited occupational education and training related to the student's academic and career objectives. Credit is established by departmental evaluation. Credit Hours: 2-60

EET390 - Cost Estimating (Same as IMAE 390) Study of the techniques of cost estimation for products, processes, equipment, projects, and systems. Prerequisite: Mathematics 111. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET392A - Electrical Engineering Technology Co-op Supervised work experience in Electrical Engineering Technology industry. Restricted to 3rd Year standing. Special approval needed from the instructor. Mandatory Pass/Fail. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET392B - Electrical Engineering Technology Co-op Supervised work experience in Electrical Engineering Technology industry. Restricted to 3rd Year standing. Special approval needed from the instructor. Mandatory Pass/Fail. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET403A - Electronic Circuit Analysis This course studies fundamental solid-state electronic concepts, the application and design of transistor amplifiers, and operational amplifier circuits. Course topics include the ideal operational amplifier, diodes, rectifiers, analysis and design of bipolar transistor (BJT) amplifiers, and the analysis and design of field effect transistor (FET) amplifiers. Prerequisites: EET 304B & EET 304BL. Co-requisite: EET 403AL. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET403AL - Electronic Circuit Analysis Lab This course demonstrates the operation of solid-state devices and provides design experience. The course covers diodes, bipolar junction transistors, and field effect transistors. The course also covers advanced Operational Amplifier applications. Students develop circuits that utilize these devices based on design specifications using industry standard components and part values. Students test these circuits to verify their operation. Design reports document student work and provide experience in technical communications and data presentation. Parts kit required. Prerequisites: EET 304B & EET 304BL. Co-requisite: EET 403A or consent of instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET403B - Electronics Application and Design This course focuses on system-level design and application of electronics circuits. Circuits include linear integrated circuits, quasi-linear circuits, integrated digital circuits, and pulse waveform generating and timing circuits. Topics include power amplifiers, Schmitt triggers, comparators, timers, and active filters. A design laboratory allows students to implement

several design projects with increasing complexity. Prerequisite: EET 403A. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 4

EET437A - Telecommunication Systems Fundamentals This course is a study of the fundamental concepts of analog and digital communication systems in addition to a survey of the state of the art of current and emerging communication technologies. Topics include modulation, signal encoding, transmission media, multiplexing, cellular, bluetooth, Wi-Fi, WiMAX and LTE-Advanced. Prerequisites: EET 304B & EET 304BL with a minimum grade of C. Co-requisite: EET 437AL. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET437AL - Telecommunication Systems Fundamentals Lab This course demonstrates the operation of a basic telecommunication system and hands-on experience with real-world applications. The course covers how to operate an oscilloscope, different signal modulations and demodulation like amplitude and frequency, and how to sample and reconstruct a communication signal. Students will design and develop communication circuits using a trainer kit. The course also covers MATLAB programming to simulate the building blocks of analog/digital communications systems. Prerequisites: EET 304B & EET 304BL with a minimum grade of C. Co-requisite: EET 437A. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET437B - Data and Computer Communication This course is a study of data and computer networks. Students are introduced to communication protocols, networking technologies and the various computer networks topologies. The OSI (Open Systems Interconnection) model is used as a guide in introducing the purpose and underlying principles of the existing communication protocol standards. The course concludes with an overview of emerging communication standards and technologies. Topics include LAN, WAN, TCP/IP, Routing, and Data Link layer. Prerequisites: EET 437A & EET 437AL with a minimum grade of C. Co-requisite: EET 437BL. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET437BL - Data and Computer Communication Lab This course gives students experience with computer networking protocols and transmission mediums through software simulation. Students use software tools to build simulated communication networks and test them using various protocols and traffic patterns. Students document their work with short reports and simulation results. Prerequisites: EET 437A & EET 437AL with a minimum grade of C. Co-requisite: EET 437B. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1

EET438A - Automatic Control Systems Technology The mathematical concepts and tools used to model and design automatic control systems. The mathematical models for electric, hydraulic, mechanical and thermal processes found in industry. The course uses Laplace transforms, transfer functions, block diagrams and signal flow graphs to represent systems, determine system response and design control systems. Prerequisites: EET 304B & EET 304BL with a C or better, or consent of instructor; EET 332A & EET 332AL. Co-requisite: EET 438AL. Credit Hours: 3

EET438AL - Automatic Control Systems Technology Lab This course gives student practical experience with the building blocks of control systems technology. Students construct analog hardware circuits that implement control and measurement functions used in automatic control systems. Software simulation tools allow students to construct mathematical models of physical systems and test their responses to input changes, disturbances and control system parameter variations. Prerequisites: EET 304B & EET 304BL with a C or better, or consent of instructor; EET 332 & EET 332AL. Co-requisite: EET 438A or consent of instructor. Credit Hours: 1

EET438B - Sequential Digital Control and Data Acquisition Concepts and components used in data acquisition and sequential control systems. The course covers sensors, signal conditioning, analog-to-digital/digital-to-analog conversion devices, relay logic design and programmable logic controllers. Prerequisites: CS 202 or ENGR 222 or ECE 222 with a C or better; EET 438A & EET 438AL with a C or better, or consent of instructor. Co-requisite: EET 438BL. Credit Hours: 3

EET438BL - Sequential Digital Control and Data Acquisition Lab This course demonstrates the fundamentals of computer-based data acquisition and control using a high-level programming language. Students conduct experiments that utilize both analog and digital signals and construct user interfaces that display the results on personal computers. Students also learn the fundamentals of industrial sequential control programming as implemented in ladder logic on programmable logic controllers. Prerequisites: CS 202 or ENGR 222 or ECE 222 with a C or better; EET 438A & EET 438AL with a C or better, or consent of instructor. Co-requisite: EET 438B. Credit Hours: 1

EET439 - Microcontroller Application and Design This course introduces embedded systems design and microcontroller programming. Students study microcontroller architectures and design applications. The course emphasizes interfacing microcontrollers with sensors and actuators. Software tools like Matlab and Simulink aid in visualization and Model-Based Design. Prerequisites: EET 238 & EET 238L with a C or better; CS 202 or ENGR 222 or ECE 222 with a C or better; or consent of instructor. Co-requisite: EET 439L. Credit Hours: 3

EET439L - Microcontroller Application and Design Lab This course provides hardware and software activities that use a microcontroller development board. Students write programs in a high-level programming language that demonstrate the capabilities of the device and its subsystems. The course covers basic digital and analog signal interfacing, communication standards, power management, and digital/analog output interfacing. Processor development board required. Prerequisites: EET 238 & EET 238L with a C or better; CS 202 or ENGR 222 or ECE 222 with a C or better; or consent of instructor. Co-requisite: EET 439. Credit Hours: 1

EET440 - Embedded Systems Design This course introduces the hardware and software necessary to successfully design and construct simple embedded systems using commonly available devices and development tools. This course uses a microcontroller and its associated software development tools to design the hardware and firmware necessary to complete an embedded system. The course reviews the internal structure of the device and how it can be programmed using a high-level language. The course utilizes both the Atmel development tool suite and the Arduino framework to program microcontrollers. This course covers the interconnection of commonly encountered input/output devices connected to microcontrollers to achieve a functional system. Prerequisites: EET 439, EET 439L. Co-requisite: EET 440L. Credit Hours: 3

EET440L - Embedded Systems Design Lab The course provides practical experience in the integration of microcontrollers, sensors and actuators to create functional electromechanical systems. The course covers interfacing both analog and digital input devices, display systems, and actuators to a microcontroller. Students use development boards and software tools to program microcontroller systems that monitor and control the physical environment. Sensor, display, actuator kit required. Prerequisites: EET 439; CS 202 or ENGR 222 or ECE 222 or consent of instructor. Co-requisite: EET 440. Credit Hours: 1

EET445 - Computer-Integrated Manufacturing (Same as IMAE 445) Introduction to the use of computers in the manufacturing of products. Includes the study of direct and computer numerical control of machine tools as well as interaction with process planning, inventory control and quality control. Prerequisite: IMAE 208. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET455 - Industrial Robotics (Same as IMAE 455) Study of robotics within a wide variety of application areas. Topics covered include classification of robots, sensor technology, machine vision; control systems, including programmable logic controllers (PLCs); robot safety and maintenance; and economic justification of robotic systems. Prerequisite: None. Restricted to 3rd Year/4th Year standing. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 3

EET492 - Special Problems in Industry and Technology Special opportunity for students to obtain assistance and guidance in the investigation and solution of selected technical problems. Not for graduate credit. Special approval needed from the instructor. Restricted to College of Engineering, Computing, Technology, and Mathematics students or departmental approval required. Credit Hours: 1-6

EET495A - Electrical Engineering Technology 4th Year Design I Capstone Design Part 1. Includes proposal and preliminary design as part of a team project. Project development skills, scope of work,

time and cost estimating, quality, ethical issues, professionalism, documentation of team member efforts, preliminary designs, identification and assignment of tasks to project team members, development of final proposal, design work and review, oral presentation of final proposal. Not for graduate credit. Restricted to 4th Year standing in Electrical Engineering Technology (second to last semester). Credit Hours: 1

EET495B - Electrical Engineering Technology 4th Year Design II Capstone Design part 2. Demonstrated project management principles. Design options & cost-benefit analysis. Development of the final decision matrix. Team coordination and documentation of team member efforts, design stages, team communication and team decision making processes. Implementation of the design (if the project warrants). Evaluation of final product. Written, oral and poster presentation of final design. Not for graduate credit. Prerequisite: EET 495A with a grade of C or better. Restricted to 4th Year standing in Electrical Engineering Technology (last semester). Credit Hours: 1

Electrical Engineering Technology Faculty

Chappanda, Karumbaiah, Assitant Professor, Ph.D., University of Utah, 2013.

DeRuntz, Bruce D., Professor, Ph.D., Southern Illinois University Carbondale, 2005.

Dunston, Julie K., Associate Professor, Ph.D., Florida State University, 1995.

Legier, John T., Associate Professor, Ph.D., Southern Illinois University, 2007.

Parks, Ronald J., Associate Lecturer, M.S., Southern Illinois University, 1995.

Velasco, Tomas, Professor and Interim Director, Ph.D., University of Arkansas, 1991.

Williams, David, Senior Lecturer, M.S.., Southern Illinois University, 2002.

Emeriti Faculty

Chang, Feng-Chang (Roger), Associate Professor, Emeritus, Ph.D., Ohio State University, 1985.

Marusarz, Ronald K., Associate Professor, Emeritus, Ph.D., Southern Illinois University Carbondale, 1999.

Spezia, Carl J., Associate Professor, Ph.D., Southern Illinois University Carbondale, 2002.

Last updated: 05/28/2026