ELECTRONIC ENGINEERING TECHNOLOGY (ACCREDITED) (EETA)

EETA 1002 Electrical Applications (3 Credits)
The student will learn the fundamentals and basic principles of DC and AC circuits. Topics include resistance, voltage, current, Ohm's law, power, capacitance, inductance, impedance, single and three phase voltage, transformers, electromagnetic induction. DC generators and motors, and relay ladder logic for motor control will also be introduced. Students will learn how to build actual circuits and use test equipment in the lab and learn how to simulate circuits using a computer simulation program.
Prerequisites: MATH 1600 or MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 102

EETA 1004 Electronics Assembly and CAD (1 Credits)
This course will introduce the student to manufacturing assembly processes and Computer Aided Design Software used in the electronics industry. Topics covered will include safety, component identification, proper hand-soldering techniques, soldering for terminals, de-soldering (re-work), automated through-hole and surface mount assembly processes, creation of schematics using an industry standard electrical CAD program, creating bill of materials, designing through-hole printed circuit boards using PCB design software. Laboratory work will include assembling, soldering, and de-soldering circuit board projects, creating schematics and designing printed circuit boards.
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 104

EETA 1010 DC Circuit Analysis (4 Credits)
The fundamentals of direct current circuit analysis are covered extensively. Topics include resistance, Ohm's law, power law, energy, series circuits, parallel circuits, series-parallel circuits, Kirchhoff's Laws, Thevenin's theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, nodal analysis, capacitance, inductance, transient response of RC and RL circuits, and ethics in engineering. Considerable circuit analysis problem solving is required. Hands-on weekly laboratory experiments reinforce the theoretical topics covered in the lecture and provide training to enable the student to build, test, and troubleshoot dc circuits with appropriate equipment such as ohmmeters, ammeters, voltmeters, and wattmeters safely and confidently.
Corequisite: MATH 1600 or MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 110

EETA 1014 AC Circuit Analysis (4 Credits)
The application of circuit analysis techniques acquired in DC Circuits Analysis are extended to circuits excited by AC sources. Emphasis is placed on solving ac circuit problems using complex numbers and phasor diagrams. Topics include transients, frequency response, power, resonance, filter theory, mutual inductance, transformer theory, and polyphase circuits. The laboratory will provide extensive experience in single and three phase circuit construction and testing.
Prerequisites: EETA 1010
Corequisite: MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 114

EETA 1026 Programming Using LabVIEW (2 Credits)
Students will learn how to create virtual instruments using LabVIEW™, a powerful graphical programming language for data acquisition and manipulation. Emphasis is placed on standard programming structures, real-time data acquisition, mathematical manipulation, and graphing.
Corequisite: MATH 1600 or MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 126

EETA 1036 Electronic Devices (4 Credits)
Semiconductor physical concepts and P-N junction theory is established and applied to modern solid-state such as diodes, Bipolar Junction Transistors and Field Effect Transistors. Voltage regulation, rectification, and biasing will also be covered. Emphasis will be placed on circuit analysis and applications using these devices. Laboratory exercises will explore the basic operating principles and analysis techniques.
Prerequisites: EETA 1010
Prerequisite or corequisite: MATH 1610 and EETA 1014
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 136

EETA 2008 Applied Calculus for Circuits (4 Credits)
The analysis of RLC circuits using classical calculus for inputs which are both sinusoidal and non-sinusoidal are examined. Basic derivatives and integration are taught as they apply to RLC circuitry. First and second order differential equations are derived and solved for circuits using classical methods and by use of Laplace transforms. The Fourier series for periodic signals will be derived and evaluated. Students will apply their programming skills in the laboratory to solve circuit problems and illustrate results graphically using LabVIEWTM .
Prerequisites: EETA 1014 AND EETA 1026 AND MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 208

EETA 2032 Advanced Electronic Devices (4 Credits)
Characteristics of small signal amplifiers using BJT's are examined, and followed up with a study of linear op-amp circuits. Comparators and Schmitt Triggers using op-amps are also explored. Basic characteristics of power amplifiers and oscillators are studied, and the operation of the thyristor family of devices is introduced. Operating principles and circuit analysis techniques are emphasized.
Prerequisites: EETA 1036 and MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 232

EETA 2051 Electronic Instrumentation (3 Credits)
A study of the operating principles of electronic and electrical instruments. Both analog and digital instruments are covered. Sources of instrument errors and standards of measurement are included, along with the design of VOM circuits and basic electronic instruments. Also included is an introduction to Basic Virtual Instrument Programming (LabVIEWTM) and data acquisition.
Prerequisites: EETA 1026 and EETA 1014
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 251

EETA 2052 Digital Electronics (4 Credits)
A study of number systems, logic gates, Boolean algebra, logic simplification using Boolean Algebra, DeMorgan's Theorems, and Karnaugh maps. Combinational logic circuits are covered extensively including adders, comparators, encoders, decoders multiplexers, and demultiplexers. Latches, flip-flops, and timers are examined as well as their applications in sequential logic circuit applications. The lecture topics are reinforced with considerable laboratory exercises requiring the student to construct, verify, and troubleshoot digital logic circuits.
Prerequisites: (EETA 1010 or EGR 2221) and (MATH 1600 or MATH 1610)
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 252

EETA 2053 Advanced Digital Electronics (4 Credits)
A continuation of the study of Digital Electronics. Topics covered include multi-bit shift registers, finite state machines, counter design (asynchronous and synchronous), logic families, A/D and D/A converters. Digital signal processing is introduced as well as the basics of data transmission. RAM and ROM memory circuits are studied. Programmable logic devices will be covered from SPLDs to FPGAs. HDL is introduced. Schematic design for a targeted FPGA is covered extensively in the lab. Students will validate their designs by programming the FPGA and testing circuit operation. Students will also be required to design, simulate, build, and test digital logic circuits using breadboards and ICs.
Prerequisites: EETA 2052
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 253

EETA 2056 Microcontrollers (4 Credits)
A study of the fundamentals of a modern microcontroller such as one of Microchip Corporation's many PICsTM. Microcontroller architecture is examined. Programming of the controller is accomplished using a high-level programming language such as Micro Engineering Lab's PICTM Basic Pro. Students will learn how to write programs, run software simulations, and use a compiler. The lab exercises will require the student to program actual microcontrollers, test for proper operation, and debug programs as needed. Programming topics covered include looping, decisions, time delays, interrupts, and LCD display. Interfacing with various hardware elements is explored.
Prerequisites: EETA 2052 and MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 256

EETA 2062 Electrical Machinery and Controls (4 Credits)
Introduces students to the electrical energy industry with a concentration on the principles of DC and AC magnetic circuits, focusing on electrical machinery, including DC generators and motors, AC single and polyphaser alternators and motors, and power transformers. Students will learn basic electrical machine control procedures, including programmable logic controllers and the use of other solid-state control devices. In the lab, students will perform experiments to gain hands-on experience with DC and AC magnetic circuits and basic electrical machines and controls. Students will learn to operate, test, assemble, and disassemble machines, prepare characteristic operating curves, and use programmable logic controllers for industrial control applications.
Prerequisites: EETA 1014, EETA 1036, and MATH 1610
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 262

EETA 2068 Control Systems (4 Credits)
An introductory course which investigates primarily electro-mechanical control systems. Discrete control systems using relay logic and programmable controllers (PLC's) are studied. Open and closed loop analog speed control systems, pneumatics, hydraulics, and Robotics are also covered.
Prerequisites: EETA 1014 and EETA 2032 and EETA 2052
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 268

EETA 2072 Electronic Communications (4 Credits)
Presents modern electronic communications based on an informational and circuit/systems framework. Students will learn the concepts of noise considerations, bandwidth, and propagation requirements, and AM and FM modulation techniques for the transmission and reception of RF signals. In the lab, students will perform experiments to gain hands-on experience in the design, construction, testing, and evaluation of the various circuits and sub-systems that comprise a communications system. Students will also learn how to combine computer simulation with bench experimentation and will learn instrumentation, waveform analysis, and circuit system performance related to modern electronic communications.
Prerequisites: EETA 2032
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 272

EETA 2090 Capstone Project (2 Credits)
Students will apply the knowledge, techniques, skills, and tools learned to a specific electronic project of interest. Students will design and develop their project which will require creating schematics, breadboarding, testing, troubleshooting, designing a PCB, soldering, and assembling the PCB into an enclosure. Cultural diversity will be explored with an emphasis on awareness and respect. Students will gain an appreciation of cultural appropriate business etiquette and strategies as they research cultural diversity. The course also requires teamwork, written and oral communication.
Prerequisites: EETA 1004 and EETA 1014 and EETA 2032 and EETA 2051 and EETA 2052
Additional fees may apply
Previous: Legacy Equivalent(s): EET* 294