INDUSTRIAL ELECTRONICS TECH (IETTI)

Courses

IETTI-101 BASIC DC CIRCUIT THEORY 4.00 Credits
The principles of basic electricity and DC circuit theory will be covered. Topics covered will include related technical math, safety procedures, components, and the principles of electrical circuit analysis including voltage, current, resistance, and related laws. Students will be required to demonstrate competency with working in groups and demonstrating appropriate interpersonal relationships.

IETTI-102 DIGITAL ELECTRONICS 4.00 Credits
Industrial electronics technicians work with many types of digital electronic systems. This course introduces the student to the theories and applications of digital electronic devices, circuits and systems. The learner will be required to demonstrate mastery of all the course objectives.

IETTI-103 INTRODUCTION TO MICROCOMPUTERS 4.00 Credits
The learner will study and apply the fundamentals of stand-alone computer systems and applications in the Industrial Electronics field, and will learn to install and configure Windows XP and Windows 7. Current media technologies will be applied to specified settings. Network-based communications will be investigated. The course will provide basic competence in supporting microcomputers. Effective communications techniques will be used in all job-related situations.

IETTI-104 ADVANCED ELECTRICAL PRINCIPLES 4.00 Credits
Students learn a variety of advanced AC electrical and electronic topics including AC power generation and distribution, three phase systems, and high power transformers. The learner will be required to demonstrate mastery of all the course objectives. A good understanding of basic algebra is needed to be successful in this course.

IETTI-105 SOLID STATE DEVICES 4.00 Credits
Solid state devices, also known as semiconductors, comprise most known integrated circuits; they are also found as discrete devices on printed circuit boards and other electronic equipment. This course introduces the student to the theories and applications of solid state devices as they are used in these applications. The learner will be required to demonstrate mastery of all the course objectives.

IETTI-106 EMBEDDED SYSTEMS 4.00 Credits
Microcontroller applications and programming.

IETTI-108 INTRODUCTION TO PLC'S 4.00 Credits
Today’s electronic technicians must be familiar with programmable logic controllers (PLC’s) as they are widely used in the industry. The course begins with an introduction to programmable logic controller hardware, memory, I/O modules, numbering systems, and programming devices. The learner will then gain experience working with PLC wiring diagrams, PCL setup configuration, and ladder logic programming.

IETTI-110 BASIC DC CIRCUIT LAB 2.00 Credits
Students will construct, analyze, predict and measure DC circuits while selecting and using appropriate test equipment. Project reports require design concepts, theoretical application, and demonstration of principles and practices learned in math, field practice and laboratory. Students will learn to adhere to safe work practices and demonstrate the proper techniques of soldering and de-soldering circuit components. Students will be required to demonstrate competency with working in groups and demonstrating appropriate interpersonal relationships. Pre-requisite: IETTI 101.

IETTI-112 AC CIRCUIT ANALYSIS 3.00 Credits
This course is designed to provide students with a foundation in the use of phasor and vector analysis for analyzing alternating current circuits. This course will also introduce logarithms, binary number systems, and Boolean algebra. Pre-requisite: MTHPT 103 or MATH 025, or permission of instructor.

IETTI-201 INTRO TO INSTRUMENTATION 4.00 Credits
Industrial electronics technicians work with equipment that sense and control pressure, temperature, flow and level. These technicians must also calibrate and service these systems. This course also covers OP-AMPS, analog-digital conversion circuits, and PID controllers.

IETTI-204 PROGRAMMING HUMAN MACHINE INTERFACES 4.00 Credits
This course will introduce the student to software and hardware that allows machine operators to interface with PLC control systems.

IETTI-205 ELECTRIC MOTORS, DRIVES AND CONTROLS 4.00 Credits
This course will give the student information and practical experience on motors, drives, and controls. The following topics will be covered: motors, control circuits, drive programming, installation fundamentals, start-up procedures, and maintenance and troubleshooting techniques.

IETTI-206 ELECTRIC MATERIALS AND TECHNIQUES 4.00 Credits
Introduces the student to electrical wiring methods and materials; safety practices and the National Electrical Code; installation of conduit and raceways; use of electrical test equipment and tools; and basic wiring techniques and theory for video, network, telephone, and fiber-optic systems. Provides the student with troubleshooting techniques and information about preventative maintenance.

IETTI-207 PROGRAM AND TROUBLESHOOT PCL’S 4.00 Credits
Today’s electronic technician must be familiar with programmable logic controllers (PLC’s) as they are widely used in industry. This course continues the ladder logic programming stared in IETTI 108. The learner will also be exposed to the types of PLC communications and troubleshooting with a PCL.
IETTI-208 PCL’S SYSTEMS APPLICATIONS 4.00 Credits
Today’s electronic technician must be familiar with programmable logic controllers (PLC’s) as they are widely used in industry. This course will give the learner additional training in programming and networking PLCs. It will also introduce him/her to motion control and operator interface devices and provide him/her with more hands-on experience.

IETTI-211 ADVANCED INSTRUMENTATION 4.00 Credits
This course will continue to present the theories, applications and procedures for process control and instrumentation introduced in IETTI 201. Instrument technicians calibrate and service equipment that sense and control pressure, temperature, flow, and level for process control systems. Pre-requisite: IETTI 201 with a grade of C or better and permission from the instructor.

IETTI-220 ADVANCE DIGITAL DESIGN 4.00 Credits
Electronics Engineering Technicians work with many digital electronic systems. Electronic Engineering Technician students continue their studies of digital devices and logic at an advanced level. The students will be introduced to Boolean logic, and combinatorial, sequential, and state machine digital circuits. The learner will be required to demonstrate mastery of all the course objectives.

IETTI-221 C COMPUTER PROGRAMMING 4.00 Credits
Electronic Engineering Technician students need to have a minimum understanding of a high level computer language. Since students entering this program will have already completed the course in Embedded Systems, they will have a suitable understanding of binary and hexadecimal numbers, and assembly language. C language is an excellent addition to the students knowledge of computer programming, and is the foundation of understanding higher computer languages such as C++ and C#. Pre-requisite: Instructor permission.

IETTI-222 ADVANCED ELECTRONICS I 4.00 Credits
Electronics Engineering Technicians work with many analog electronic systems. Electronic Engineering Technician students continue their studies of solid state devices at an advanced level. The learner will be required to demonstrate mastery of all the course objectives. Pre-requisite: Instructor permission.

IETTI-223 ADVANCED ELECTRONICS II 4.00 Credits
This course builds on IETTI 102 and 105. Electronic Engineering Technician students will continue their studies of solid state devices and digital electronics at an advanced level. Circuit design is introduced for integrated circuits that include active filters, oscillators, Schmitt trigger circuits, integrated-power amplifiers, and voltage regulators. The learner will be required to demonstrate mastery of all the course objectives. Prerequisite: MATH 170 and instructor approval.

IETTI-224 ADVANCED ELECTRONICS III 4.00 Credits
This course is an introduction to the transient response analysis of RLC circuits. First, the computation of the transient response through classical differential equation techniques is covered. Next, Laplace transform techniques are studied, unifying both the transient and frequency response techniques. Then, Fourier analysis techniques are introduced to familiarize the students with the fundamentals of signal analysis. Finally, the State Variable technique is used to compute the transient response of RLC networks. Throughout the course, the lectures are supported by experimental work that make use of the hardware and computer-aided facilities available in the program. Prerequisite: MATH 170 and instructor approval.

IETTI-225 INTRODUCTION TO PROGRAMMABLE DEVICES 4.00 Credits
Students must design, construct, and program an electronic project which includes a Field Programmable Logic Gate Array (FPGA) as approved by the instructor. Upon completion of the project, each student will present the project to the class. Pre-requisite: IETTI 106.

IETTI-226 ELECTRONIC CIRCUIT TROUBLESHOOTING 3.00 Credits
Electronics Engineering Technicians work with analog and digital electronic systems. In this course, students will learn what to do when these systems don’t work. Students will be introduced to basic troubleshooting techniques including test equipment, component identification, fault isolation, and documentation. The learner will be required to demonstrate mastery of all the course objectives.

IETTI-290 DIRECTED STUDY IN INDUSTRIAL ELECTRONICS TECHNOLOGY 1.00-10.00 Credits
Required study in area agreed upon by the student and the instructor. Might include specialized devices, new products, or advanced troubleshooting.

IETTI-292 DIRECTED SPECIAL PROJECTS 3.00 Credits
IETTI-294 INTERNSHIP IN INDUSTRIAL ELECTRONICS 12.00 Credits
Work experience in business related to student’s career goals. Student is a paid part-time employee working under the supervision of the employer and program coordinator.