

Electronics Technology Assessment Plan Rev. 4/3/2018

Electronics Technology	14-15	15-16	16-17	17-18	18-19	19-20
ELETB1 - Basic Electronics (DC and AC)						
• Upon completion the student will be able to; Identify the production, characteristics, applications, and voltage change methods of Direct Current and Alternating Current.						X
• Upon completion the student will be able to; Apply circuit analysis methods for DC and AC circuits containing resistive devices, capacitors, and inductors using Ohm's Law, Watt's Law, and Kirchoff's Laws.		X		X		
• Upon completion the student will be able to; Choose and perform measurements using multimeters, oscilloscopes, and signal generators, perform circuit fabrication using electronic schematic diagrams, and perform simple problem-isolation techniques on laboratory circuits.					X	
• Upon completion the student will be able to; Identify common component symbols, and explain the functions of common electronic components.						X
• Upon completion the student will be able to; List the career opportunities in Electronics Technology, the methods for receiving training in those areas, and essential workplace skills that are needed for career success in a technical field.				X		
ELETB4 - Computer Integrated Manufacturing						
• Upon completion the student will be able to; Demonstrate a working knowledge of DF1, DH-485, Ethernet, Foundation Fieldbus communication protocols		X				
• Upon completion the student will be able to; Develop a PLC ladder logic program.		X				
• Upon completion the student will be able to; Program a PLC to control a non-servo robot and to program a servo-driven robot					X	
• Upon completion the student will be able to; Implement and configure an Enterprise Resource Planning system						X
• Upon completion the student will be able to; Configure and operate an automatic storage and retrieval system (ASRS)				X		
• Upon completion the student will be able to; Demonstrate a working knowledge barcode symbols and barcode readers, and computer numerically controlled machine tools					X	
ELETB5 - Programmable Logic Controllers						
• Upon completion the student will be able to; Successfully develop ladder logic diagrams for a PLC application and program the SLC-500 PLC using RSLogix software		X				
• Upon completion the student will be able to; Accurately explain SLC-500 addressing and successfully create input/output configurations for the SLC-500		X				
• Upon completion the student will be able to; Successfully implement program timer-on/timer-off and up-counter/down counter instructions					X	
• Upon completion the student will be able to; Successfully create a communications configuration using RSLinx software						X
• Upon completion the student will be able to; Accurately utilize math instructions, logic comparisons, bit shift instructions and sequencer instructions in PLC programming				X		
• Upon completion the student will be able to; Adequately control PLC programs using master control reset instructions and subroutines.					X	
ELETB6 - Analog and Digital Electronics						
• Upon completion the student will be able to; Students will identify electronic components and component symbols as well as explain the functions of basic semiconductor and digital electronic devices, identify and interpret analog and digital electronic schematic diagrams, and implement circuit wiring using given circuit parameters and schematic diagrams.		X				
• Upon completion the student will be able to; Students will apply measurement techniques at a more advanced nature, choosing the proper electronic test equipment available for use in the lab, and the proper measurement techniques chosen from previous demonstrations and experience.		X				
• Upon completion the student will be able to; Students will explain the function of, and apply in simple interfacing activities: basic sensor devices, basic output devices and indicators, digital logic circuits, digital-analog and analog-digital converters, motion devices, amplifier circuits, filter circuits, and power supply circuits.						X
• Upon completion the student will be able to; Students will perform circuit analysis and simple troubleshooting using mathematic calculations, given parameters, electronic test equipment, and fabrication techniques.						X

Electronics Technology Assessment Plan Rev. 4/3/2018

Electronics Technology	14-15	15-16	16-17	17-18	18-19	19-20
------------------------	-------	-------	-------	-------	-------	-------

ELETB55A - Electric Motors - Controls

• Upon completion the student will be able to;Students will correctly identify, describe the function of, and wire in an appropriate lab activity the various types of AC and DC motors, including: stepper, synchronous, wound rotor, shaded pole, universal motors, and other types found in industrial applications.		X				
• Upon completion the student will be able to;Students will correctly explain the use, applications, and functions of manual starters, magnetic starters, solid-state starters, motor control circuits, and other common control devices found in industrial applications.		X				
• Upon completion the student will be able to;Students will correctly explain the use, applications, functions, and correctly wire and program motor drives, including Variable Frequency Drives.					X	
• Upon completion the student will be able to;Students will correctly identify, explain the use, applications, and functions of input devices, relays, pilot devices, control circuits, and other industrial electronic components and devices commonly found in industrial applications.					X	
• Upon completion the student will be able to;Students will correctly use electronic test equipment and problem-isolation methods to make measurements, and determine, within the laboratory applications, the cause and solution of motor, controls, and drive circuits.						X
• Upon completion the student will be able to;Students will accurately read and interpret ladder diagrams and wiring diagrams appropriate for industrial electronics circuits.						X

ELETB56 - Instrumentatn/Process Control

• Upon completion the student will be able to;Explain the operation, programming, and calibration of closed loop process controllers and control systems, including liquid level, flow, pressure, and temperature.		X				
• Upon completion the student will be able to;Define closed-loop tuning and give an application.		X				
• Upon completion the student will be able to;Create and interpret instrument tags and line symbols used in piping and instrument (P&ID) diagrams.					X	
• Upon completion the student will be able to;Describe the operation of current and pressure methods of transmitting instrument valves, and the applications of current-to-pressure converters.					X	
• Upon completion the student will be able to;Describe the operation of PID control and give an application.						X

ELETB58 - Advanced Programmable Logic Controllers

• Upon completion of the course, the student will be able to successfully develop ladder logic diagrams for a PLC application and program the Control Logix PLC using RSLogix software.		X				
• Successfully create a communications configuration using RSLinx software		X				
• Successfully implement program timer-on/timer-off and up-counter/down counter instructions.						X
• Accurately explain Control Logix tag based addressing and successfully create input/output configurations for the PAC.				X		

ELETB61 - Telecommunications

• Upon completion the student will be able to;Students will identify and explain the basic telecommunication principles identified in the Certified Electronics Systems Technicians international certification test (National System Contractor's Association) Skill Areas 1-6 that apply to the content of this course.						X
• Upon completion the student will be able to;Students will apply skills and knowledge gained in this course to implement telecommunication (voice, data, and fiber) circuits, selecting the proper installation methods, materials, and certification methods.		X				
• Upon completion the student will be able to;Students will perform troubleshooting of telecommunication system wiring and components.					X	

ELETB62 - Radio Communications

• Upon completion the student will be able to;Students will analyze the operation of electronic communication systems and circuits used to transmit audio, video, data, and control signals.				X		
• Upon completion the student will be able to;Students will explain: the various forms of modulation, principles of transmission and reception of radio signals, and multiplexing.		X				
• Upon completion the student will be able to;Students will analyze, explain the function of, and build/tune basic radio communications circuits, such as: power supplies, oscillators, mixers, converters, audio, IF, and RF amplifiers, modulators, demodulators, tuners, automatic gain control, and squelch circuits.					X	
• Upon completion the student will be able to;Students will use electronic test equipment, such as: oscilloscopes, signal generators, and multimeters to perform adjustment/tuning, circuit analysis, and troubleshooting within the laboratory environment.						X

Electronics Technology Assessment Plan Rev. 4/3/2018

Electronics Technology	14-15	15-16	16-17	17-18	18-19	19-20
ELETB63 - Electronic Systems Installatn						
• Upon completion the student will be able to; Properly plan, install, configure, and test/certify electronic systems in the following categories: residential telephone, residential data networks, cable and satellite systems, video systems, audio systems, home automation systems, and alarm systems.				X		
• Upon completion the student will be able to; Demonstrate industry-approved competencies in the design and installation of electronic systems as identified by <u>CompTIA or Leviton Residential Integrators certifications</u>				X		
• Upon completion the student will be able to; Demonstrate adequate knowledge of installation and wiring certification parameters					X	
• Upon completion the student will be able to; Demonstrate safe working procedures, design standards, and code compliance issues relating to the installation of <u>electronic systems</u> .						X
• Upon completion the student will be able to; Demonstrate adequate knowledge of customer service and training skills for residential integrators.					X	
ELETB70 - Mechanical Systems						
• Upon completion the student will be able to; Students will choose the appropriate hand, power, or stationary power tool, and demonstrate or explain its use, <u>when given a task to perform that requires the use of a hand, portable, or stationary tool.</u>		X				
• Upon completion the student will be able to; Students will choose the proper fastening, machining, or welding/soldering/brazing process, as well as demonstrate or explain the proper use and function of the chosen process, when given a task to perform where <u>materials, mechanical systems, or structural systems are to be fastened, joined, or machined.</u>				X		
• Upon completion the student will be able to; Students will demonstrate the appropriate bearing or bushing choice, the appropriate seal, gasket or packing material to be used, the proper lubrication material and method, and the proper maintenance procedure and interval when given a mechanism for design, <u>maintenance, or repair.</u>					X	
• Upon completion the student will be able to; Students will perform the correct calculations for RPM and torque of mechanical drive systems, including chain/gear, gear-gear drive, and belt/pulley systems, as well as correctly explaining the benefits and limitations of each mechanical drive system.						X
• Upon completion the student will be able to; Students will perform hands-on and assigned activities for the following related skills for maintenance technicians: reading engineering drawings, locating and researching technical information, ordering spare parts, developing preventative maintenance <u>schedules, and maintaining equipment history</u>					X	