

Electronics Technology Assessment Plan Rev. 9/17/2018

Electronics Technology	16-17	17-18	18-19	19-20	20-21	21-22
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**ELETB1 - Basic Electronics (DC)**

• 1. Upon successful completion of the course, the student will correctly identify the production, characteristics, applications, and voltage change methods of <u>Direct Current electricity.</u>				P		
• 2. Upon successful completion of the course, the student will correctly calculate quantities in DC circuits containing resistive devices, capacitors, and inductors using <u>Ohm's and Watt's Laws, Kirchhoff's Laws, and appropriate circuit analysis methods.</u>			P			P
• 3. Upon successful completion of the course, the student will correctly perform circuit measurements using multimeters, perform circuit fabrication using <u>electronic schematic diagrams, and perform simple problem-isolation techniques on laboratory circuits.</u>			P			
• 4. Upon completion the student will be able to: Identify common component symbols, and explain the functions of common electronic components.		C				

**ELETB1A - Basic Electronics (DC)**

• 1. Upon successful completion of the course, the student will correctly identify the production, characteristics, applications, and voltage change methods of <u>Direct Current electricity.</u>			P			
• 2. Upon successful completion of the course, the student will correctly calculate quantities in DC circuits containing resistive devices, capacitors, and inductors using <u>Ohm's and Watt's Laws, Kirchhoff's Laws, and appropriate circuit analysis methods.</u>			P			
• 3. Upon successful completion of the course, the student will correctly perform circuit measurements using multimeters, perform circuit fabrication using <u>electronic schematic diagrams, and perform simple problem-isolation techniques on laboratory circuits.</u>			P			
• 4. Upon successful completion of the course, the student will correctly identify common component symbols and explain the functions of common electronic components.			P			

**ELETB1B - Electronic Circuits (AC and Analog)**

• 1. Upon successful completion of the course, the student will accurately measure and correctly apply the related theories and characteristics of <u>Alternating Current circuits, and accurately calculate reactive circuit quantities, including impedance and resonance.</u>			P			
• 2. Upon successful completion of the course, the student will correctly explain the purpose and application of semiconductor components in the following <u>circuit types: power supplies, amplifiers, power handling, active filters, and oscillator circuits.</u>			P			
• 3. Upon successful completion of the course, the student will correctly apply the theory and practice of analog electronic circuits, sensor and measurement circuits, and introductory-level digital circuits, including: basic digital applications, circuit categories and types, and digital signal processing.			P			
• 4. Upon successful completion of the course, the student will correctly and accurately use electronic test equipment such as: multimeters, oscilloscopes, and signal generators in the <u>testing and troubleshooting of analog circuits.</u>			P			

**ELETB3 - Programmable Logic Controllers**

• 1. Upon successful completion of the course, the student will understand and explain the SLC-500 addressing structure needed to control discrete components.			P			
• 2. Upon successful completion of the course, the student will understand and explain the serial and Ethernet communication configurations for the SLC-500 PLC.			P			
• 3. Upon successful completion of the course, the student will be able to identify and recognize discrete inputs and outputs.			P			

**ELETB4 - Computer Integrated Manufacturing**

• 1. Upon successful completion of the course, the student will understand and explain automation systems, production systems, and different types of <u>manufacturing operations.</u>			P			
• 2. Upon successful completion of the course, the student will understand and explain the configuration and operation of PLC controlled systems utilized in <u>material handling.</u>			P			
• 3. Upon successful completion of the course, the student will be able to identify and recognize components required for job center work order processing.			P			

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**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.		C				P
• 2. Upon successful completion of the course, the student 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.		C				P
• 3. Upon successful completion of the course, the student 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.		C		P		
• 4. Upon successful completion of the course, the student will perform circuit analysis and simple troubleshooting using mathematic calculations, given parameters, electronic test equipment, and fabrication techniques.		C		P		

**ELETB48WE - Occupational Work Experience Education/Internship**

• 1. Upon completion of the course, the student will be able to Articulate the specific work experience objectives in electronics as described by employer and identify the various skills, knowledge and attitudes necessary to the accomplishment of those objectives.			P			
• 2. Upon completion of the course, the student will be able to Demonstrate the acquisition of the various skills, knowledge and attitudes necessary to the completion of the work experience objectives in electronics and the ability to effectively meet employer's job expectations.			P			
• 3. Upon completion of the course, the student will be able to Identify and analyze the application of acquired skills, knowledge and attitudes to career opportunities in electronics.			P			

**ELETB55A - Electric Motors - Controls**

• 1. Upon successful completion of the course, the student will correctly recognize, explain the operation of, and apply the knowledge of common industrial electronic components and devices covered in the course to design, test, and implement motor control circuitry and systems according to safety codes/regulations, safe work practices, and requirements/specifications provided to the student.			P			
• 2. Upon successful completion of the course, the student will accurately calculate, configure, and select the appropriate wiring configuration of the common DC, single-phase AC, three-phase AC, stepper, and servo motor types, as well as three-phase transformer configurations.			P			
• 3. Upon successful completion of the course, the student will correctly interpret and explain the operation of the most common motor control circuits, including: basic control, sequenced and timed operation, jogging, plugging, motor protection (overload and over-current), pilot devices, reversing circuits using various interlocking methods, dynamic and injection braking, DC and AC current generation, and similar applications, with an emphasis on safe work practices, electrical and safety codes/guidelines, and following standard lockout/tagout and energy isolation practices.			P			

**ELETB56 - Instrumentation and Process Control**

• 2. Upon successful completion of the course, the student will be able to Identify the schematic diagrams of a wheat stone bridge, and the following operational amplifiers (op amps): comparator, inverting, summing, noninverting, difference, integrator and differentiator. Calculate the outputs of the comparator, inverting, summing, noninverting, and difference operational amplifiers (op amps).			P			
• 3. Upon successful completion of the course, the student will explain the operation of closed loop process controllers and the methods to mitigate control loop error.			P			
• Upon completion the student will be able to; Create and interpret instrument tags and line symbols used in piping and instrument (P&ID) diagrams.			P			
• 4. Upon successful completion of the course, the student will describe the four control modes of controller operation.			P			
• 5. Upon successful completion of the course, the student will describe the operation of sensors [pressure, temperature, level, flow] and the basic operation for a current to pressure transducers.			P			

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<b>ELETB58 - Advanced Programmable Logic Controllers</b>						
• 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.						P
• Successfully create a communications configuration using RSLinx software						P
• Successfully implement program timer-on/timer-off and up-counter/down counter instructions.				P		
• Accurately explain Control Logix tag based addressing and successfully create input/output configurations for the PAC.			P			
<b>ELETB61 - Telecommunications</b>						
• 1. Upon successful completion of the course, the student 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.				P		
• 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.						P
• 3. Upon successful completion of the course, the student will perform installation and troubleshooting of telecommunication systems, wiring and components.		C	P			
<b>ELETB62 - Radio Communications</b>						
• 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.			P			
• 2. Upon successful completion of the course, the student will explain: the various forms of modulation, principles of transmission and reception of radio signals.						P
• 3. Upon successful completion of the course, the student 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, using electronic test equipment, such as: oscilloscopes, signal generators, and multimeters to perform adjustment/tuning, circuit analysis, and troubleshooting within the laboratory environment.				P		
<b>ELETB63 - Electronic Systems Installatn</b>						
• 1. Upon successful completion of the course, the student will 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.			P			
• 2. Upon successful completion of the course, the student will demonstrate adequate knowledge of installation and wiring certification parameters.			P			
• Upon completion the student will be able to; Demonstrate safe working procedures, design standards, and code compliance issues relating to the installation of electronic systems.				P		
<b>ELETB70 - Mechanical Systems</b>						
• 1. Upon successful completion of the course, the student will be able to: choose the appropriate hand, power, or stationary power tool, and demonstrate or explain its use, when given a task to perform that requires the use of a hand, portable, or stationary tool.						P
• 2. Upon successful completion of the course, the student will be able to: 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 materials, mechanical systems, or structural systems are to be fastened, joined, or machined.		C				
• 3. Upon successful completion of the course, the student will be able to: 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, maintenance, or repair.			P			
• 4. Upon successful completion of the course, the student will be able to: accurately 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.				P		
• 5. Upon successful completion of the course, the student will be able to: successfully 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 preventive maintenance schedules, and maintaining equipment history.			P			