

Unit/Standard Number	Electrical, Electronic and Communications Engineering Technology/Technician CIP 15.0303 Task Grid	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
Secondary Competency Task List		
100	SAFETY	
101	Describe OSHA safety regulations.	
102	Identify, select, and demonstrate proper hand tool use for electronics work.	
103	Recognize the types and usages of fire extinguishers.	
104	Interpret Safety Data Sheets (SDS).	
105	RESERVED	
106	Explain the chemical and environmental hazards for disposal of electronics equipment.	
107	Describe electrical shock and list the effects of electric current on the human body.	
200	ELECTRICAL QUANTITIES AND COMPONENTS	
201	Describe electronic measurements and their applications.	
202	Identify the fundamental SI units.	
203	Apply proper scientific and engineering notation.	
204	RESERVED	
205	Identify resistor values by color code and numerical markings	
206	Identify component symbols used in electronic schematic diagrams.	
207	Identify schematic symbols for various types of electrical and electronic components.	
208	Identify semiconductors and symbols and explain their usage.	
300	INSTRUMENTATION	
301	Utilize multi-meters, function generators, and frequency counters.	
302	RESERVED	
303	RESERVED	
304	Use a power supply.	
400	OHM'S/WATT'S LAW	
401	Apply the concept of Ohm's law to determine current, voltage, or resistance.	
402	Identify the relationship between voltage, current, resistance, and power in DC using the 12 basic common formulas derived from Ohm's and Watt's Law Pie Chart.	
403	RESERVED	
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405	RESERVED	

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500	SERIES CIRCUITS	
501	Apply Kirchhoff's Voltage Law in a series circuit.	
502	RESERVED	
503	RESERVED	
504	Solve for equivalent resistance in a series circuit.	
505	Analyze power consumption, dissipation and energy units in a series circuit.	
506	Analyze the affects of open circuits and short circuits in series circuits.	
600	PARALLEL CIRCUITS	
601	Solve for equivalent resistance in a parallel circuit.	
602	Explain voltage in a parallel circuit.	
603	Apply Kirchhoff's Current Law in a parallel circuit.	
604	RESERVED	
605	Analyze power consumption, dissipation and energy units in a parallel circuit.	
606	Analyze the affects of open circuit and short circuit conditions in parallel circuits.	
700	SERIES-PARALLEL CIRCUITS	
701	Solve for equivalent resistance in a Series-Parallel combination circuit.	
702	Apply Kirchhoff's current and voltage law to a Series-Parallel Circuit.	
703	Analyze and troubleshoot DC combination/complex circuits.	
800	RESERVED	
801	RESERVED	
802	RESERVED	
803	RESERVED	
804	RESERVED	
805	RESERVED	
806	RESERVED	
900	ALTERNATING CURRENT	
901	Calculate the period and frequency of the waveform.	
902	Determine the peak-to-peak, average and RMS values of a sine-wave.	
903	Explain various waveforms.	
1000	OSCILLOSCOPE	

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1001	Describe the basic sections of an oscilloscope.	
1002	Measure voltage using an oscilloscope.	
1003	Measure frequency using an oscilloscope.	
1004	Measure phase relationships using an oscilloscope.	
1100	INDUCTANCE	
1101	Measure and calculate the effect of a series resistive-inductive (RL) circuit on DC voltage and current.	
1102	Measure and calculate the effect of a series resistive-inductive (RL) circuit on AC voltage and current.	
1103	Calculate the total inductance of inductors connected in series or parallel.	
1200	INDUCTIVE REACTANCE	
1201	Measure and calculate the effect of inductive reactance on current.	
1202	Measure and calculate the effect of change in frequency on current.	
1203	Identify the phase (lead-lag) relationship between current and applied voltage in a series RL circuit.	
1204	Calculate the total inductive reactance in series and parallel circuits.	
1300	RESISTOR INDUCTOR (RL) CIRCUITS IN ALTERNATING CURRENT (AC)	
1301	Use vectors to describe magnitude and direction of voltages.	
1302	Use vectors in determining total current or voltage in series and parallel RL circuits.	
1400	TRANSFORMERS	
1401	Identify transformer windings, types and usages.	
1402	Calculate and measure voltage-turns ratio.	
1403	Measure the effect of secondary load on primary current.	
1404	Troubleshoot transformers for open and short circuit conditions.	
1500	CAPACITANCE	
1501	Identify the effect of capacitance in AC and DC circuits.	
1502	Solve for equivalent capacitance in series and parallel circuits.	
1503	Calculate and measure RC time constants.	
1600	CAPACITIVE REACTANCE	
1601	Measure and calculate the effect of capacitive reactance on current.	
1602	Measure and calculate the effect of change in frequency on circuit current.	
1603	Identify phase (lead-lag) relationship between current and applied voltage in a series RC circuit.	
1604	Calculate the total capacitive reactance in series and parallel circuits.	

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1700	RESISTANCE CAPACITANCE (RC) CIRCUITS	
1701	Describe magnitude and direction of voltages using vectors.	
1702	Determining total current or voltage in series and parallel RC circuits using vectors.	
1703	RESERVED	
1800	RESISTANCE INDUCTANCE CAPACITANCE (RLC) CIRCUITS	
1801	Calculate total current in series RLC circuits.	
1802	Calculate total current in parallel RLC circuits.	
1803	RESERVED	
1804	RESERVED	
1900	RESONANCE	
1901	Calculate and measure the resonant frequency of a series RLC circuit.	
1902	RESERVED	
1903	Calculate the "Q" of a series resonant circuit.	
1904	Calculate and measure the resonant frequency of a parallel RLC circuit.	
1905	RESERVED	
2000	SOLDERING - DESOLDERING	
2001	Demonstrate types and usage of soldering/desoldering equipment.	
2002	Desolder components from the circuit board.	
2003	Solder components to the circuit board.	
2004	Properly and safely demonstrate soldering and de-soldering methods.	
2100	DIODES	
2101	Test diodes and identify the cathode and anode.	
2102	Analyze the voltage-current relationship of diodes by plotting the characteristic curve.	
2103	Distinguish the correct bias for the operation of a LED.	
2104	Compare the forward and reverse characteristics of a Zener diode.	
2200	POWER SUPPLIES	
2201	Identify common rectifier circuits (half-wave and full-wave).	
2202	Construct and analyze the operation of a rectifier circuit.	
2203	Investigate the cause and effect of power supply filtering, hum and common filter types.	
2204	RESERVED	
2205	Measure and calculate power supply ripple percentage and voltage regulation.	
2206	RESERVED	

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2207	RESERVED		
2208	Measure and identify the regulation properties of a shunt type Zener regulator.		
2300	TRANSISTOR CHARACTERISTICS		
2301	Identify base, emitter, and collector terminals of PNP and NPN transistors.		
2302	Locate the ratings, characteristics and operating parameters listed on a typical transistor specification sheet.		
2303	Determine the type of transistor, NPN or PNP, and operating condition.		
2304	Identify schematic symbols and uses for various types of transistors.		
2305	Compare FET and BJT devices.		
2400	SMALL SIGNAL AMPLIFIERS		
2401	Use biasing polarity of NPN or PNP transistors.		
2402	Calculate gain.		
2403	Distinguish between basic amplifier configurations.		
2404	RESERVED		
2405	RESERVED		
2500	OPERATIONAL AMPLIFIERS		
2501	Construct and analyze the phase shift between input and output of an inverting IC Op-Amp.		
2502	Construct and analyze the phase shift between input and output of a non-inverting IC Op-Amp.		
2600	BASIC DIGITAL ELECTRONICS		
2601	Convert between numbering systems (decimal, binary, octal and hexadecimal).		
2602	RESERVED		
2603	Identify the operation and develop the truth tables for the seven basic logic gates.		
2604	Connect combinational logic (multiplexer, demultiplexer, half-adder, full-adder).		
2605	Apply Boolean reduction and construct Karnaugh mapping for complex logic circuits.		
2700	RESERVED		
2701	RESERVED		
2702	RESERVED		
2800	TROUBLESHOOTING		
2801	Utilize the order of the troubleshooting process to detect failures in electrical and electronic circuits.		
2802	Analyze and troubleshoot failures in electrical and electronic circuits.		
2900	ELECTRONIC COMMUNICATIONS		

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2901	Identify and explain the major components of a basic communication system.	
2902	RESERVED	
3000	MOTORS	
3001	Describe the characteristics of AC and DC motors.	
3002	Describe characteristics of induction and Stepper motors.	
3003	Explain the difference between brushed and brushless motors.	
3004	Explain the use and function of a servomechanism to control the performance of a device.	
3005	Identify pulse-width modulation, motor controllers and speed controllers.	
3100	HISTORY OF ELECTRONICS - PAST, PRESENT and FUTURE	
3101	Examine the cause and effect of past, present and future technologies.	
3102	RESERVED	
3103	RESERVED	