

Electronics

Career Cluster	STEM
Course Code	17106
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundation courses – cluster course – Introduction to Energy/Power – specialized pathway course – capstone experience
Student Organization	None
Coordinating Work-Based Learning	Field trips/tours, guest speakers
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Technology Education
Resources	Occupational Safety and Health Administration (OSHA)- http://www.osha.gov Institute of Electrical and Electronics Engineers – https://www.IEEE.org

Course Description:

The Introduction to Electronics course is designed to provide a basic understanding electronics which include how to design and create components, diagnose, troubleshoot and repair electronic components. Through classroom study and hands-on experience, students prepare for work within the electronics field using current technology, safety and ethical procedures.

Program of Study Application

This is a pathway course in the STEM cluster Electronics pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course in STEM, and followed by a more specialized pathway course such as Robotics.

Course Standards**Indicator # E1 Determine general technical literacy skills**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recall	E 1.1 Employ appropriate units and abbreviations in electronics. <i>Examples:</i> <ul style="list-style-type: none"> • Tabulate whole number expressions to appropriate electronic exponential expressions • Recognize differences between electronic exponential expression and scientific notation • Define abbreviations used in a schematic diagram 	Math skills
Two Skill/Concept	E 1.2 Determine unknown values in multiple types of electronic circuits <i>Examples:</i> <ul style="list-style-type: none"> • Calculate unknown electronic unit values using given or measured values • Apply appropriate formula to solve for unknown values in a variety of circuits • Apply ratings of resistors based on color bands 	Math skills
One Recall	E 1.3 Identify proper terminology in electronics <i>Examples:</i> <ul style="list-style-type: none"> • Label and identify the parts of a circuit • List the parts of a circuit • Draw a parallel and series circuit 	

Notes:

Indicator # E2 Demonstrate proficiency in electronic safety

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	<p>E 2.1. Determine physiological responses to electrical shock</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Classify ways electrical shock can damage the human body • Tell how electrical shock can cause death • Summarize safety concerns in various working environments 	<p>Safety skills</p> <p>General classroom procedures</p> <p>Program procedures</p> <p>Review OSHA handbook</p>
One Recall	<p>E 2.2. Demonstrate proper safety procedures in the use of soldering and electronics testing equipment</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Use proper personal protective equipment • Define methods to reduce the severity of electrical shock • State and follow all safety rules based on <i>Occupational Safety and Health Administration (OSHA)</i> standards 	<p>*OSHA</p>

Notes:

Indicator # E3 Demonstrate proficiency in circuit assembly

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	E 3.1. Construct a circuit using schematic symbols for identified components <i>Examples:</i> <ul style="list-style-type: none"> • Apply resistor color code to identify proper resistor values • Determine proper polarity for electrolytic capacitors • Distinguish components correctly in relation to a schematic diagram 	
Two Skill/Concept	E 3.2. Construct circuit boards using correct soldering principles and techniques <i>Examples:</i> <ul style="list-style-type: none"> • Connect components in proper position on circuit board • Show ability to handle components carefully • Determine proper amounts of solder to cover the connection 	
Three Strategic Thinking	E 3.3. Determine cause of non-operational circuits <i>Examples:</i> <ul style="list-style-type: none"> • Assess a non-operational bread-board circuit • Draw conclusions to select proper test equipment for repair of faulty circuits • Investigate and repair circuit board 	

Notes:

Indicator # E4 Determine proper use of electronic test equipment

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recall	E 4.1. Measure resistance, voltage, and current in circuits <i>Examples:</i> <ul style="list-style-type: none"> • Match test leads in proper positions • Arrange meter selector switch in proper position • Recite meter reading using correct measurement values 	
One Recall	E 4.2. Classify equipment for signal analysis <i>Examples:</i> <ul style="list-style-type: none"> • List equipment that provides signal outputs • Identify equipment that measures signals • Identify the various signals 	

Notes:**Indicator # E5 Troubleshoot circuits for proper operation**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	E 5.1. Calculate voltage, current, and power solutions in circuits <i>Examples:</i> <ul style="list-style-type: none"> • Predict correct formula or law to solve for unknown values • Show calculated values using proper measurement values • Make observations for proper operation of circuits 	
Two Skill/Concept	E 5.2. Troubleshoot solutions to analyze circuit operation <i>Examples:</i> <ul style="list-style-type: none"> • Estimate the values of components within a circuit • Graph calculated and measured values • Compare values to determine if they are within circuit parameters 	

Notes:

Indicator # E6 Explore electronics career options

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	<p>E 6.1 Research career opportunities in electronics fields</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Investigate and research career opportunities in the electronics field using career exploration software • Investigate the career exploration software to research educational requirements for chosen career path • Formulate a report about career opportunities in the electronics field • Revise and update student portfolio 	<p>Internet ethics Job Services High school counselors Community/ Industry SDMyLife BLS.gov Robotics, engineering, and electronics</p> <p>Career Development</p>
One Recall	<p>E 6.2 Explore career outlook for robotic applications</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Identify jobs that will be created/eliminated by robotics • List new robotics related careers 	

Notes: