

WGSD Curriculum
Industrial Technology Department

Course: Advanced Electronics

Grade Level: 10-12

LG 8 Electronic Circuits and Devices

High Priority Standards

MoDese Performance Indicators for Electronics

Electronics

B. Test fundamental electronic circuits and devices in accordance with Industry and Safety Standards.

K. Construct circuits consistent with industry and safety standards.

Missouri Learning Standards

Math

Algebra –Creating Equations D.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm’s law $V = IR$ to highlight resistance R*

Learning Goal

Students will be able to test fundamental electronic circuits and devices.

Proficiency Scale

Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal.

Level 3: Student demonstrates mastery with the learning goal as evidenced by:

- Evaluating transformers, capacitors, inductors, and resistive devices to detect problems.
- Evaluating basic circuit controls (e.g., switches, fuses, and circuit breakers) to detect problems.
- Applying a recursive method of evaluation when working with electronic problems.

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	<ul style="list-style-type: none">• Applying Ohm's law. <p>Level 2: Student demonstrates he/she is nearing proficiency by:</p> <ul style="list-style-type: none">• Recognizing and recalling specific vocabulary, such as: plate, dielectric, receivers, capacitors, direct current, Capacitance rating, farads, electrolytic capacitors, variable capacitors, time constant, voltage plate.• Performing processes such as:<ul style="list-style-type: none">○ Identifying and testing sources of DC and AC signals and power.○ Testing DC circuits (e.g., parallel and series-parallel). <p>Level 1: Student demonstrates a limited understanding or skill with the learning goal.</p>
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Grade Level: 10-12

LG 9 Semiconductors

High Priority Standards

MO Dese Standards for Industrial Technology

Electronics

G. Test equipment.

K. Construct circuits consistent with industry and safety standards.

Learning Goal	Proficiency Scale
Students will be able to test semiconductor devices consistent with industry and safety standards.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: <ul style="list-style-type: none">• Evaluating diodes for problems or malfunctions.• Evaluating transistors (e.g., BJTs and FETs) for problems or malfunctions.• Evaluating thyristors (e.g., SCRa, TRIACs and DIACs) for problems or malfunctions.• Analyzing test results and repair voltage and current regulator circuits. Level 2: Student demonstrates he/she is nearing proficiency by: <ul style="list-style-type: none">• Recognizing and recalling specific vocabulary, such as: diodes, transistors, thyristors, semiconductors, BJT, FET, SCRa, TRIAC, DIAC.• Performing processes such as:<ul style="list-style-type: none">○ Evaluate and test batteries.○ Demonstrate proper semiconductor handling and replacing

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	Level 1: Student demonstrates a limited understanding or skill with the learning goal.
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Course: Advanced Electronics
Grade Level: 10-12
LG 10 Circuits

High Priority Standards

MO Dese Standards for Industrial Technology

Electronics

G. Test equipment.

K. Construct circuits consistent with industry and safety standards.

Learning Goal	Proficiency Scale
Students will be able to construct circuits consistent with industry and safety standards.	Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal. Level 3: Student demonstrates mastery with the learning goal as evidenced by: <ul style="list-style-type: none">• Evaluating IO devices such as such as keyboards, printers, and recording equipment.• Analyzing common optical devices such as photodetectors, emitters, optical isolators, and LEDs.• Constructing multistage circuits according to schematic diagrams.• Soldering and de-soldering components to IPC Standards. Level 2: Student demonstrates he/she is nearing proficiency by: <ul style="list-style-type: none">• Recognizing and recalling specific vocabulary, such as: multimeter, current, optical devices, multistage circuits, IPC standards• Performing processes such as:<ul style="list-style-type: none">○ Testing and repairing audio and video systems.

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- Measuring voltage, current and resistance.
- Thru-hole soldering and de-soldering components.

Level 1: Student demonstrates a limited understanding or skill with the learning goal.

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LG 11 Advanced Safety

High Priority Standards

**MO Dese Standards for Industrial Technology
Electronics**

B. Appreciate and apply all personal and workplace safety procedures.

Missouri Learning Standards

ELA

Reading in Science and Technical areas 11-12.2: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. (First aid manuals, electrical code manuals)

Learning Goal	Proficiency Scale
<p>Students will be able to apply personal and workplace safety procedures in electrical construction environments.</p>	<p>Level 4: Student demonstrates an in-depth inference or advanced application or innovates with the learning goal.</p> <p>Level 3: Student demonstrates mastery with the learning goal as evidenced by:</p> <ul style="list-style-type: none"> • Demonstrating safe use of AC line-operated equipment such as isolation transformers, grounding, leakage current testing, and GFCI. <p>Level 2: Student demonstrates he/she is nearing proficiency by:</p> <ul style="list-style-type: none"> • Recognizing and recalling specific vocabulary, such as: ground fault current interrupter (GFCI), current leakage, isolation transformer. • Performing processes such as: <ul style="list-style-type: none"> ○ Identifying electrical hazards before beginning a job. ○ Following first-aid procedures as directed by workplace and industry

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	<p>standards.</p> <p>Level 1: Student demonstrates a limited understanding or skill with the learning goal.</p>
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