

Course Outcomes Guide (COG)

Course Title: INT 110 Fundamentals of Electricity

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Expected Learning Outcomes

This is an introductory class and students are not expected to know anything about electricity prior to attending the class.

Students will understand and be able to describe electron theory.
Students will be able to describe the characteristics and differences between conductors and insulators.
Students will be able to explain the concepts of current flow, AC/DC circuits and Ohms law.
Students will be able to recognize standard schematic symbols for common electrical and electronic components.
Students will be able to explain the operation and application of common components such as AC and DC motors, relays, switches, power supplies, overload devices and lighting.
Students will be able to recognize and use common test equipment to evaluate electrical circuits.
Students will be able to trouble-shoot basic electrical circuits using schematic diagrams.
Students will be able to identify hazards of electrical circuits and be able to work safely.

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

During the semester, students completed three long tests that consisted of multiple choice questions I pulled from a test bank provided by the text book publisher, and problems that required them to use math and various analytical skills to solve. (e.g. analyzing circuits to find voltages and currents) I either created these myself or found example problems in the Internet, primarily AllAboutCircuits.com. Students also completed lab exercises in class and homework assignments.

Students will understand and be able to describe electron theory.	Test
Students will be able to describe the characteristics and differences between conductors and insulators.	Test
Students will be able to explain the concepts of current flow, AC/DC circuits and Ohms law.	Test
Students will be able to recognize standard schematic symbols for common electrical and electronic components.	Lab Assignments

Students will be able to explain the operation and application of common components such as AC and DC motors, relays, switches, power supplies, overload devices and lighting.	Test
Students will be able to recognize and use common test equipment to evaluate electrical circuits.	Lab Assignments
Students will be able to trouble-shoot basic electrical circuits using schematic diagrams.	Lab Assignments
Students will be able to identify hazards of electrical circuits and be able to work safely.	Lab Assignments and Test

Validation (What methods have you used or will you use to validate your assessment?)

1. The evaluation of student performance and ability to transfer knowledge to next level of class in the program.
2. Consult Advisory Committee participants as to performance of interns and hired students based on ability and knowledge gained.

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

The average overall grade (n=13) was 82%. Parallel circuits are still a challenge. Several students had a hard time determining whether resistors were in series or in parallel. And, calculating the total resistance of a parallel circuit.

Overall, the students did a good job working together during labs. They completed 20 basic electricity labs and three on motors—all using the LabVolt training equipment.

Follow-up (How have you used or how will you use the data to improve student learning?)

Next semester I intend to make this part of the class more hands on. The students will use bread boards and hook up parallel/series circuits and test them with multi-meters. Also, the math department is preparing to have tutoring session tailored specifically for ELE 110.

Next semester, I am going to pick and choose the basic electricity labs more carefully to exclude any that take a long time and don't demonstrate the more important points. Also, the class will do more magnetic/motor related labs. I would also like to use breadboards more and not rely solely on the LabVolt equipment.

Budget Justification (What resources are necessary to improve student learning?)

I will order the bread board kits with lab fee money.