



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number	Course Title	Credits
EET 138	Introduction to Electronics I	4
Hours: Lecture/Lab/Other	Co- or Pre-requisite	Implementation Semester & Year
3 Lecture/3 Lab	MAT 038 or MAT 044	Spring 2022

Catalog description:

Focuses on direct current (DC) devices and circuits. Progresses from the fundamentals of electricity, Ohm's Law, Kirchoff's Law, series and parallel circuits to the study of resistors, capacitors, inductors, batteries, transistors, and diodes as they pertain to DC circuits.

General Education Category:
Not GenEd

Course coordinator:
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Required texts & Other materials:

Electronics Technology Fundamentals (Conventional Flow Version) by Robert Paynter and B.J. Boydell, 3rd Edition, Prentice Hall Publishing, ISBN 978-0-13-504874-0

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Compute direct current (DC) circuit values using electrical theory. [ILG # 2, 3, 4, 10, 11; PLO # 2, 4, 7]
2. Wire simple, series, parallel, and series-parallel DC circuits. [ILG # 3, 4, 10, 11; PLO # 2, 5, 7, 8]
3. Test and troubleshoot the operations of resistive DC circuits. [ILG # 2, 3, 4, 10, 11; PLO # 4, 5, 7, 8]
4. Effectively communicate findings with fellow students and others using field appropriate terminology. [ILG # 1, 10; PLO # 1, 3]

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1. Written and Oral Communication in English. Students will communicate effectively in both speech and writing.

Institutional Learning Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Institutional Learning Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 10. Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for Electronics Engineering Technology (PLO)

1. Communicate effectively in English, both orally and in written form.
2. Demonstrate an understanding of the fundamentals of AC and DC electricity.
3. Work as a team with fellow workers.
4. Demonstrate mastery of college algebra and trigonometry.
5. Demonstrate mastery of job skills such as soldering, metalworking, and PC board repair.
7. Demonstrate an understanding of analog circuits, including linear integrated circuits.
8. Set up and operate modern electronic equipment such as DMM, oscilloscope, and signal generators.

Units of study in detail – Unit Student Learning Outcomes:

Unit I **Basic Principles of Electricity [Supports Course SLO #1, 2, 3, 4]**

Learning Objectives

The student will be able to:

1. Create a simple circuit using a wiring diagram.
2. Measure voltage, current, and resistance with a multimeter.
3. Use an American wire gauge table to select correct wire size based on circuit current needs.
4. Calculate circuit voltage, current, and resistance using Ohm's Law.
5. Calculate power dissipation.
6. Interpret resistor values based on the resistor color code or numerical markings.
7. Select correct resistor size based on the power requirements of the circuit.
8. Connect batteries to increase overall voltage or current providing ability.
9. Effectively document and report lab results, comparing calculated responses to actual outcomes.
10. Exhibit effective time management through the division of responsibilities while working as a team partner.

Unit II **Series and Parallel Circuits [Supports Course SLOs #1, 2, 3, 4]**

Learning Objectives

The student will be able to:

1. Identify series and parallel elements in a circuit.
2. Calculate voltages, currents, and power dissipations in a series circuit.
3. Reduce a series circuit to a single equivalent total resistance.
4. Wire and troubleshoot a series resistive circuit.
5. Calculate voltages, currents, and power dissipations in a parallel circuit.
6. Reduce a parallel circuit to a single equivalent total resistance.
7. Wire and troubleshoot a parallel resistive circuit.
8. Calculate voltages, currents, and power dissipations in a series-parallel circuit.
9. Reduce a series-parallel circuit to a single equivalent total resistance.
10. Effectively document and report lab results, comparing calculated responses to actual outcomes.
11. Exhibit effective time management through the division of responsibilities while working as a team partner.

Unit III **Circuit Analysis and Magnetism** [Supports Course SLOs # 1, 3, 4]

Learning Objectives

The student will be able to:

1. Reduce a circuit to an equivalent voltage source and resistance using Thevenin's Theorem.
2. Reduce a circuit to an equivalent current source and resistance using Norton's Theorem.
3. Calculate voltages and currents in a multisource circuit using Superposition Theorem.
4. Identify north and south poles of an electromagnet.
5. Describe the overall effect on an electromagnet when changing core material, the number of coil turns, coil length, or current intensity through the coil.
6. Effectively document and report lab results, comparing calculated responses to actual outcomes.
7. Exhibit effective time management through the division of responsibilities while working as a team partner.

Evaluation of student learning: [Evaluates SLOs # 1, 2, 3, 4]

Students' achievement of the course objectives will be evaluated through the use of the following:

- Three unit tests assessing students' comprehension of terminology, calculations and practices related to the unit objectives.
- Lab grade based on individual reports on experimental results.
- In class participation and attendance.

Evaluation Tools	Percentage Of Grade
3 Unit Tests	60%
Lab Grade	30%
Participation	10%
Total	100%