

COURSE INFORMATION:

Course Prefix/No.:	EEM 105
Course Title:	Basic Electricity
Lecture Hours/Week:	2.0
Lab Hours/Week:	0.0
Credit Hours/Semester:	2.0

[Distance Learning Attendance/VA Statement](#)
[Textbook Information](#)

COURSE DESCRIPTION:

This course is a survey of basic electrical principles, circuits, and measurements.

COURSE COMPETENCIES:

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

Module 1 - Safety

- Observe general safety rules.
- Discuss the importance of knowing how to administer first-aid.
- Observe the proper lock-out and tag-out procedures.
- Explain the effects of electric current on the body.
- Select the appropriate PPE for a given task and/or location.
- Demonstrate the proper use of ladders and scaffolds.
- Discuss the operation and purpose of a GFCI.
- Discuss the importance of proper grounding.

Module 2 - Measuring Instruments & Meters

- Discuss the differences between an analog and a digital meter.
- Properly connect a voltmeter into a circuit.
- Properly connect an ammeter into a circuit.
- Demonstrate the proper use of a clamp-on ammeter.
- Properly connect a digital voltmeter into a circuit.
- Demonstrate the proper use of ranges on a digital multimeter.
- Demonstrate the proper way to connect the ohmmeter.
- Demonstrate the proper use of ranges on an ohmmeter.
- Demonstrate the proper use of a voltage sensing device.

Module 3 - Basic Electrical Theory & Ohms Law

- Discuss the structure of atoms.
- Discuss the differences between conductors and insulators.
- Discuss common electrical quantities
- Perform Ohm's law calculations.

Module 4 - Series, Parallel, & Combination Circuits

- Provide the definition of a series circuit.
- List the rules of a series circuit.
- Define parallel circuits.
- List the rules of a parallel circuit.
- Determine electrical values in a series and parallel circuits.
- Determine the current path(s) through a combination circuit.
- Determine the total resistance through a combination circuit.
- Determine voltage drops across elements of a combination circuit

Module 5 - Basic Alternating Circuits

- Discuss the differences between direct current and alternating current.
- Discuss and recognize different types AC waveforms.
- Determine values of peak, RMS, and average voltages.
- Explain wavelength.
- Discuss different types of AC loads.

Module 6 - Inductance and Capacitance in an AC Circuit

- Discuss inductance and inductors.
- Calculate inductance.
- Calculate inductive reactance.
- Calculate impedance.
- Discuss voltage and current relationships in an inductive circuit.
- Define capacitance.
- Determine the charge and discharge time of a capacitor.
- Discuss how current appears to flow through a capacitor.
- Calculate capacitive reactance.
- Determine values of reactance, current, and power in a purely capacitive circuit.
- Discuss voltage and current relationships in a purely capacitive circuit.

Module 7 - Basic RL Circuits

- Define an RLC circuit.
- Vector an inductive circuit.
- Vector a capacitive circuit.
- Vector an RLC Circuit.

Module 8 - Transformers & Motors

- Discuss the basic principles of the center-tapped distribution transformer.
- Discuss the basic principles of the single-phase control transformer.
- Discuss the basic principles of the isolation transformer.
- Discuss the basic principles of the three-phase, wye-connected transformer.
- Discuss the basic operating principles of single-phase motors.

STANDARDS:

Assignments and attendance must be completed as designated in "Evaluation Strategies/Grading." Criteria for minimal acceptable performance will be provided by the instructor.

REQUIREMENTS:

Attendance Policy

The college attendance policy, stated in the college handbook, will be honored.

Academic Honesty

Students are expected to adhere to the college policy regarding student conduct as stated in the college handbook.

Assignments

Students are expected to complete all assignments and any supplementary exercises designated by the instructor.

EVALUATION STRATEGIES/GRADING:

Students must complete all modules, including assignments, projects, labs, and tests. Students must earn at least a "C" in order for the course to serve as a prerequisite and for the course to apply towards a certificate.

Grading Scale:

A = 90 - 100
B = 80 - 89.9
C = 70 - 79.9
D = 60 - 69.9
F = 00 - 59.9

Evaluation Method:

Tests/Projects	9.38% for each Module
Work Attitude	3.12% for each Module

12.5% X 8 module grades = 100% Final Grade

Work Attitude is defined as:

- Participation
- Cooperation
- Appearance
- Effort
- Safety
- Responsibility
- Professionalism
- Attendance
- Self Motivation
- Works Independently

ENTRY LEVEL SKILLS:

The student must be able to read and solve basic mathematical equations.

PREREQUISITES/CO-REQUISITES:

Prerequisite:

RDG 031 or equivalent

Co-requisite:

None

METHODS OF INSTRUCTION:

Lectures, reading assignments, projects, discussions, video presentations, multi-media presentations, and web content are the major teaching methods used in this course. See instructor for specifics.

LAB EXERCISES (See addendum or instructor for additional details)