

COURSE INFORMATION:

Course Prefix/No.:	EEM 141
Course Title:	Residential/Commercial Codes
Lecture Hours/Week:	3.0
Lab Hours/Week:	0.0
Credit Hours/Semester:	3.0

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

COURSE DESCRIPTION:

This course covers National Electrical Code (NEC), including a study in and application of, the NEC and city and county electrical ordinances as pertaining to residential and commercial wiring.

COURSE COMPETENCIES:

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

Module 1 - NFPA 70 Introduction, General Electrical Installation Requirements

- Understand the layout to the NEC[®].
- Correctly utilize Article 100 of the NEC[®].
- Discuss the proper requirements for electrical installations using Article 110 in the NEC[®].

Module 2 - Branch Circuits

- Discuss the proper installation methods for a branch circuit.
- Discuss GFCI and AFCI protection requirements.
- Explain the importance of temperature limitations and conductor terminations.
- Determine the minimal burial depths of service entrance conductors.
- Using the NEC[®], determine the proper location of electrical outlets in a dwelling.
- Using the NEC[®], determine the minimum number of general lighting, small appliance, and laundry circuits required in a dwelling.
- Locate the clearance requirements for branch circuits, installation requirements for lighting in clothes closets, and installation requirements for recessed lighting in a dwelling.
- Locate the minimum size conductors supplying a storage-type electric water heater.
- Using the NEC[®], determine the proper installation of baseboard heating.
- Using the NEC[®], determine the proper installation of room air conditioners.
- Correctly size conductors according to Article 310 in the NEC[®].

Module 3 - Services and Load Calculations

- Locate the clearance requirements for outside aerial feeders
- Using the NEC[®], determine the demand load and the minimum ampere rating for a single-family and a multi-family dwelling using both, the standard and optional methods.
- Using the NEC[®], determine the minimum overhead service entrance clearance allowed.
- Using the NEC[®], determine the demand load and the minimum ampere rating for a small commercial building and a farm building.
- Determine the minimum size ungrounded feeder conductors, grounded feeder conductor, and grounding electrode conductor for a dwelling.
- Calculate the demand loads for cooking equipment using the NEC[®].
- Calculate the demand load for clothes dryers using the NEC[®].

Module 4 - Wire, Raceway, and Box Sizing (Commercial)

- Using the NEC[®], determine the size of a conductor for a given circuit considering the ambient temperature and number of conductors in a raceway.
- Using the NEC[®], determine the minimum size raceway that is permitted when conductors are all the same size or when the conductors are sized differently.
- Using the NEC[®], determine the minimum size wireway and conduit nipples permitted for a given set of conductors.
- Using the NEC[®], determine the minimum dimensions for pull boxes and conduit bodies.
- Discuss the proper methods for installing metallic and nonmetallic boxes in both a residential and commercial application.

Module 5 - Grounding and Bonding

- Explain the purpose of equipment grounding and electrical system grounding
- Define bonding.
- Determine the minimum size grounding electrode conductor for a service entrance to a building.
- Determine the minimum size equipment grounding conductor permitted for a branch circuit and feeder when the overcurrent protection is known.
- Using the NEC[®], determine proper grounding methods and electrodes.
- Discuss the local city and county requirements on grounding.

Module 6 - Motor Circuit Wiring

- Using the NEC[®], determine the full load current for AC single-phase and three-phase motors.
- Using the NEC[®], determine the minimum and maximum overload protection.

- Using the NEC[®], determine the minimum conductor size for a motor branch circuit.
- Using the NEC[®], determine the minimum feeder conductor size for a single motor or multiple motor circuit.
- Determine the maximum permitted rating of the overcurrent protection device for the branch-circuit short-circuit and ground-fault protection.
- Determine the type and the minimum permitted controller for a motor.

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. The instructor will provide specific requirements for the course.

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 = 00.0 - 59.9

Evaluation Method:

Tests/Projects	12.50% for each Module
Work Attitude	4.17% for each Module

16.67% X 6 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