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

[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<sup>®</sup>.
- Correctly utilize Article 100 of the NEC<sup>®</sup>.
- Discuss the proper requirements for electrical installations using Article 110 in the NEC<sup>®</sup>.

#### **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<sup>®</sup>, determine the proper location of electrical outlets in a dwelling.
- Using the NEC<sup>®</sup>, 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<sup>®</sup>, determine the proper installation of baseboard heating.
- Using the NEC<sup>®</sup>, determine the proper installation of room air conditioners.
- Correctly size conductors according to Article 310 in the NEC<sup>®</sup>.

#### **Module 3 – Services and Load Calculations**

- Locate the clearance requirements for outside aerial feeders
- Using the NEC<sup>®</sup>, 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<sup>®</sup>, determine the minimum overhead service entrance clearance allowed.

- Using the NEC<sup>®</sup>, 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.
- Calculated the demand loads for cooking equipment using the NEC<sup>®</sup>.
- Calculate the demand load for clothes dryers using the NEC<sup>®</sup>.

#### **Module 4 – Wire, Raceway, and Box Sizing (Commercial)**

- Using the NEC<sup>®</sup>, determine the size of a conductor for a given circuit considering the ambient temperature and number of conductors in a raceway.
- Using the NEC<sup>®</sup>, 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<sup>®</sup>, determine the minimum size wireway and conduit nipples permitted for a given set of conductors.
- Using the NEC<sup>®</sup>, 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<sup>®</sup>, determine proper grounding methods and electrodes.
- Discuss the local city and county requirements on grounding.

#### **Module 6 – Motor Circuit Wiring**

- Using the NEC<sup>®</sup>, determine the full load current for AC single-phase and three-phase motors.
- Using the NEC<sup>®</sup>, determine the minimum and maximum overload protection.
- Using the NEC<sup>®</sup>, determine the minimum conductor size for a motor branch circuit.
- Using the NEC<sup>®</sup>, 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	Responsibility
Cooperation	Professionalism
Appearance	Attendance
Effort	Self Motivation
Safety	Works Independently

## **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**

## **ENTRY LEVEL SKILLS**

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

**PREREQUISITE:** RDG 031 or equivalent

**CO-REQUISITES:** None

**Disabilities Statement:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Offices (SR) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.