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**Course Prefix/No.:** EEM 140  
**Course Title:** National Electrical Code  
**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 is a study of the National Electrical Code (NEC) and is based on the latest codes as published by the National Fire Protection Agency (NFPA). (It is not the intent of this course to adequately prepare the student to obtain an electrician's license.)

### **COURSE COMPETENCIES**

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

#### **Module 1 – NFPA 70 Introduction, General Wiring, and Electrical Fundamentals**

- Discuss the layout and the structure of the NEC.
- Discuss basic electrical fundamentals and locate electrical definitions in the NEC.
- Locate and interpret necessary codes when referring to general requirements for electrical installations and conductors.
- Discuss and locate articles referring to wiring and protection.

#### **Module 2 – Wire, Raceway, and Box Sizing**

- 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.

#### **Module 3 – Outlets, Lighting, Appliances, and Heating**

- 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 outside aerial feeders and 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.

#### **Module 4 – Services and Feeder Calculations**

- 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 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.

#### **Module 5 – Grounding and Bonding**

- Explain the purpose of equipment grounding, electrical system grounding, and 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.

#### **Module 6 – Overcurrent Protection**

- Name two types of overcurrent protection.
- Define and explain the differences between over-current protection and ground-fault protection.
- Explain the purpose of the overcurrent protection device.
- Determine the interrupting rating of an overcurrent protection device for a given feeder, branch-circuit, or electrical equipment demand load.

#### **Module 7 – Motor Circuit Wiring**

- Using the tables in the NEC, determine the full load current for AC single-phase and three-phase motors and all DC 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.

#### **Module 8 – Hazardous Location Wiring**

- Using the NEC, explain and define the difference between a Division 1 and a Division 2, Class I hazardous location.
- Using the NEC, explain and define the difference between a Division 1 and a Division 2, Class II hazardous location.
- Using the NEC, describe the conditions that constitute a Class III hazardous location.
- Using the NEC, determine the proper wiring methods and equipment for each of the hazardous conditions and locations.

#### **MINIMAL 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, 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 = 90.0 – 100  
B = 80.0 – 89.9  
C = 70.0 – 79.9  
D = 60.0 – 69.9  
F = 00.0 – 59.9

### Evaluation Method:

Tests/Projects	75% of each module
Work Attitude	25% of each module

Each module counts 12.5% of final grade

Work Attitude is defined as:

- |                                        |                                              |
|----------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Participation | <input type="checkbox"/> Responsibility      |
| <input type="checkbox"/> Cooperation   | <input type="checkbox"/> Professionalism     |
| <input type="checkbox"/> Appearance    | <input type="checkbox"/> Attendance          |
| <input type="checkbox"/> Effort        | <input type="checkbox"/> Self Motivation     |
| <input type="checkbox"/> Safety        | <input type="checkbox"/> Works Independently |

## ENTRY LEVEL SKILLS

The student must be able to demonstrate knowledge of basic electrical terminology and a capability to perform basic mathematical equations.

**PREREQUISITES:** RDG 031 or equivalent, EEM 117

**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.

Effective: 2007SU