

## **COURSE SYLLABUS**

<b>LAST REVIEW</b>	Fall 2022
<b>COURSE TITLE</b>	National Electric Code II
<b>COURSE NUMBER</b>	ELET 0210
<b>DIVISION</b>	Career and Technical Education
<b>DEPARTMENT</b>	ELET
<b>CIP CODE</b>	46.0302
<b>CREDIT HOURS</b>	4
<b>CONTACT HOURS/WEEK</b>	Class: 2.5      Lab: 3
<b>PREREQUISITES</b>	ELET0110 National Electric Code I

### **COURSE DESCRIPTION**

Upon successful completion of this course, the student should be able to use the current National Electrical Code to do calculations involving loads, lighting and circuit sizing. The course will cover typical load calculations used in both residential and commercial settings. The student should also be able to interpret and apply the National Electrical Code rules to special wiring systems including Hazardous Locations, Elevators, Remote-control circuits and Fire Alarm systems.

### **PROGRAM ALIGNMENT**

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

[https://kansasregents.org/workforce\\_development/program-alignment](https://kansasregents.org/workforce_development/program-alignment)

### **PROGRAM LEARNING OUTCOMES**

1. The Student will be able to identify workplace safety issues in accordance with OSHA standards.
2. Upon successful completion of this course, the student should be able to identify the job skills necessary to have a successful career in the Electrical Profession.
3. Inspect electrical circuit connections in accordance with the N.E.C. standards of compliance.

### **TEXTBOOKS**

<http://kckccbookstore.com/>

### **METHOD OF INSTRUCTION**

A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

## **COURSE OUTLINE**

- I. NEC Chapter 5 Special Occupancies
  - A. Define the three types of classified hazardous locations.
  - B. Explain the difference between a division 1 and a division 2 condition in the hazardous locations.
  - C. Explain the material groups (A through G) used in hazardous locations and what hazard class they belong to.
  - D. Describe the wiring methods required for each class of hazardous location (explosion proof vs. ignition proof).
  - E. Explain the use of conduit seals.
  - F. Explain the NEC rules for grounding and bonding in hazardous locations
- II. NEC Chapter 6 Special Equipment
  - A. Define the NEC rules for branch circuit wiring in machine room spaces.
  - B. Explain the NEC rules for wiring a hoist-way pit.
  - C. Describe the requirements for the elevator disconnecting means.
  - D. Explain the requirements for Ground Fault Circuit Interruption for personnel in an elevator room.
- III. NEC Chapter 7 Special Conditions
  - A. Define the circuit requirements for Class 1, 2, and 3 remote-control circuits.
  - B. Distinguish the difference between Class 1 power sources and Class 2 and 3 power sources.
  - C. Explain the NEC rules for separation from other power systems.
  - D. Explain the listing and marking requirements for Class 2 and Class 3 cables.
  - E. Explain the NEC rules for Fire Alarm circuits, NEC Article 760.
  - F. Describe the requirements for non-power-limited Fire Alarm circuits, (NPLFA).
  - G. Describe the requirements for Power-limited Fire Alarm circuits, (PLFA)
- IV. NEC Chapter 8 Communications
  - A. Explain protection per NEC rules for communications circuits entering buildings
  - B. Explain radio and television receiving and transmitting per NEC
  - C. Explain community antenna television and radio distribution systems per NEC
  - D. Explain network powered broadband communication systems per NEC
- V. NEC Chapter 9 Tables

- A. Explain the use of raceway fill using Table 1 NEC.
- B. Calculate radius of conduit per Table 2 NEC.
- C. Calculate the dimensions and percent area of conduit per Table 4 NEC
- D. Calculate dimensions of insulated conductors and fixture wires per Table 5 NEC
- E. Calculate dimensions of compact copper and aluminum buildings per Table 5A
- F. Calculate dimensions of conductor properties per Table 8.
- G. Explain table 9 on alternating current resistance and reactance

## **COURSE LEARNING OUTCOMES AND COMPETENCIES**

Upon successful completion of this course, the student will:

- A. Interpret and apply special occupancies per NEC.
  - 1. Interpret and apply NEC to hazardous locations.
  - 2. Interpret and apply NEC to aircraft hangars.
  - 3. Interpret and apply NEC to bulk storage plants.
  - 4. Determine special occupancies.
  - 5. Explain areas requiring respiratory equipment.
  - 6. Determine signs and symbols of warnings.
  - 7. Interpret and apply NEC to Carnivals and Circuses.
  - 8. Interpret and apply NEC to Manufactured Buildings.
  - 9. Interpret and apply NEC to Recreational Vehicles.
  - 10. Interpret and apply NEC to Park Trailers
  - 11. Interpret and apply NEC to Floating Buildings and Marinas.
- B. Interpret and apply special equipment per NEC.
  - 12. Interpret and apply NEC to cranes and hoists.
  - 13. Interpret and apply NEC to Elevators and Dumbwaiters
  - 14. Interpret and apply NEC to Electric Vehicle Charging Stations.
  - 15. Interpret and apply NEC to Electric Welders.
  - 16. Interpret and apply NEC to Information Technology Equipment.
  - 17. Interpret and apply NEC to Swimming Pools and Fountains.
  - 18. Interpret and apply NEC to Solar Photovoltaic Systems.
  - 19. Interpret and apply NEC to Fuel Cell Systems.
  - 20. Interpret and apply NEC to Fire Pumps.
- C. Interpret and apply special conditions per NEC.
  - 21. Interpret and apply NEC to emergency systems.
  - 22. Interpret and apply NEC to over current protection.
  - 23. Interpret and apply NEC to critical operations power systems.
  - 24. Interpret and apply NEC to circuits operating at less than 50 volts.
  - 25. Interpret and apply NEC to fire alarm systems.
  - 26. Interpret and apply NEC to optical fiber cables and raceways.

- D. Interpret and apply communications per NEC.
  - 27. Use National Electric Code for Communications Circuits.
  - 28. Interpret and apply NEC to Radio and Television Equipment.
  - 29. Interpret and apply NEC to Network Powered Broadband.
  - 30. Interpret and apply NEC to Radio Distribution Systems.
  
- E. Interpret and apply tables per NEC.
  - 31. Interpret and apply NEC to determine Percent of Cross Sections
  - 32. Determine Radius of Conduit and Tubing Bends.
  - 33. Determine Dimensions and Percent Area of Conduit.
  - 34. Interpret and apply NEC Table 5 on Insulated Conductors.
  - 35. Interpret and apply NEC Table 5A on Wire Nominal Dimensions
  - 36. Interpret and apply NEC Table 8 on Conductor Properties.
  - 37. Interpret and apply NEC Table 9 on Alternating Current Resistance and Reactance for 600-volt Cables, 3-Phase.

## **ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES**

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

## **COLLEGE POLICIES AND PROCEDURES**

*Student Handbook*

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

*College Catalog*

<https://www.kckcc.edu/academics/catalog/index.html>

*College Policies and Statements*

<https://www.kckcc.edu/about/policies-statements/index.html>

*Accessibility and Accommodations*

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.