

Washtenaw Community College Comprehensive Report

ELE 204 National Electrical Code

Effective Term: Winter 2016

Course Cover

Division: Advanced Technologies and Public Service Careers

Department: Industrial Technology

Discipline: Electricity/Electronics

Course Number: 204

Org Number: 14400

Full Course Title: National Electrical Code

Transcript Title: National Electrical Code

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Course Change

Change Information:

Course description

Total Contact Hours

Outcomes/Assessment

Rationale: This course should be 60 contact hours. It is a 4 credit hour lecture only class with no lab. Therefore, 75 contact hours makes no sense.

Proposed Start Semester: Winter 2016

Course Description: In this course, students learn the use of the NEC as a tool to plan the safe installation of electrical equipment in residential, commercial, and industrial locations. Students determine the required number and sizes of branch circuits, conductors, fuses, raceways and boxes. Other topics include grounding, motor circuits and controls, local codes, and code changes. Recommended for students interested in industrial control technology and electrician apprentices.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 60 Student: 60

Lab: Instructor: 0 Student: 0

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Level II Prerequisite

ELE 111

or equivalent

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Apply an understanding of the National Electrical Code (NEC) organization of chapters, articles and sections to effectively locate specific material in the Code needed to do residential, commercial, farm, and industrial wiring and to be successful with electrical examinations.

Assessment 1

Assessment Tool: Multiple choice test

Assessment Date: Winter 2016

Assessment Cycle: Every Three Years

Course section(s)/other population: all

Number students to be assessed: all

How the assessment will be scored: Answer Key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental (ELE) faculty

2. Interpret NEC rules and perform electrical calculations using the tables in the NEC needed to do wiring installations.

Assessment 1

Assessment Tool: Multiple choice test

Assessment Date: Winter 2016

Assessment Cycle: Every Three Years

Course section(s)/other population: all

Number students to be assessed: all

How the assessment will be scored: Answer Key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental (ELE) faculty

Course Objectives

1. Identify the purpose, scope, and enforcement of the National Electrical Code (NEC).
2. Identify the organization of the NEC.
3. Identify grounded conductors by their color code.
4. Determine the location of electrical outlets in a dwelling.
5. Determine the preferred type of wire for a branch-circuit.
6. Identify the clearance requirements for outside aerial feeders and branch circuits.
7. Apply the NEC to the selection and installation of overcurrent protection devices.
8. Identify the purpose of electrical system and equipment grounding, and define bonding.
9. Identify which wire of an electrical system is required to be grounded if the electrical system is one required to be grounded.
10. Select a conductor from the proper wire table.
11. Use correction and adjustment factors to determine the ampacity of conductors.
12. Determine the minimum size wireway and conduit nipples permitted for conductors.
13. Determine the minimum size junction box or device box permitted to take conductor fill into consideration.
14. Determine the minimum dimensions permitted for conduit bodies for various applications.
15. Select switches and receptacles with the proper rating for a particular application.
16. Determine the correct overcurrent protection for a panelboard.
17. Select the type and rating of disconnect required for a motor circuit.
18. Select the type and rating of the controller for a motor.

19. Determine the minimum permitted size of the branch-circuit conductors for air-conditioning or refrigeration equipment.
20. Identify the purpose of transfer equipment for a standby power system.
21. Identify the different classes, divisions, and groups of hazardous locations.
22. Identify the function of an explosion-proof enclosure.
23. Identify the wiring materials from which a manufactured wiring system is constructed.
24. Identify the requirements for conductor insulation when used for elevators, dumbwaiters, escalators, and moving walks.
25. Determine the required number of branch-circuits for a set of loads.
26. Determine the correct rating for branch-circuit protective devices.
27. Determine the required minimum size conductor for a branch-circuit.
28. Determine minimum permitted demand load for various service entrances.
29. Determine minimum permitted conductor size, rating and type for various service entrances.
30. Determine the minimum size equipment grounding conductor permitted for a branch circuit and feeder if the rating of the overcurrent protection is known.
31. Determine the allowable ampacity and ampacity derating factor applicable when more than three current-carrying conductors are in flexible cord or cable.
32. Determine the minimum size wire permitted when more than three current-carrying conductors are in flexible cord or cable.
33. Determine the size of a conductor for a circuit considering ambient temperature and more than three conductors in the raceway, cord, or cable.
34. Determine the minimum size conduit permitted when the conductors are all the same size and type of insulation.
35. Determine the minimum size conduit permitted when the conductors are different sizes and different types of insulation.
36. Determine the minimum number of general lighting and small appliance circuits permitted in a dwelling.
37. Determine correct ampacity and overcurrent protection for electric heating elements.
38. Determine the ampere rating of various motors using the NEC.
39. Determine conductor, overload, and fuse or circuit-breaker sizes for single motor and multi-motor installations.
40. Determine the minimum size conductor permitted to connect a standby generator to a wiring system.
41. Determine the maximum permitted overcurrent protection for a specific transformer.
42. Determine the minimum permitted primary and secondary conductors for a specific transformer application.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom

Reviewer

Faculty Preparer:

Dale Petty

Department Chair/Area Director:

Thomas Penird

Dean:

Action

Faculty Preparer

Recommend Approval

Date

Nov 02, 2015

Nov 10, 2015

| | | |
|---|---------------------------|---------------------|
| <i>Brandon Tucker</i> | <i>Recommend Approval</i> | <i>Nov 12, 2015</i> |
| Curriculum Committee Chair: <i>Kelley Gottschang</i> | <i>Recommend Approval</i> | <i>Dec 07, 2015</i> |
| Assessment Committee Chair: <i>Michelle Garey</i> | <i>Recommend Approval</i> | <i>Dec 10, 2015</i> |
| Vice President for Instruction: <i>Michael Nealon</i> | <i>Approve</i> | <i>Dec 14, 2015</i> |