SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Electrician Construction Program
Revision Date: January 11, 2021
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	ELET1723
Course Title:	NFPA 70E, OCPD's & Grd and Bond
Prerequisite(s):	ELET1722 and ELET1726
Corequisite(s):	ELET1727
Catalog Description:	NFPA 70E is discussed further and an arc flash risk assessment and a hazard risk assessment are completed. The study of the various Overcurrent Protection Devices (OCPD) are covered in detail. The concepts of Grounding and Bonding are covered along with the types of grounding electrodes, their connections and how to properly calculate their sizes. The understanding of the total costs involved with a project are covered along with the importance of planning and communication.
Credit Hours:	4
Class Hours:	45
Lab Hours:	45
Total Contact Hours:	90

II. COURSE OBJECTIVES: *Course will:*

A. Continue to build upon what was learned in course ELET1716 as well as introduce new concepts and work processes.
B. Express the importance of maintenance of an overcurrent protection device (OCPD) when determining the available short circuit current.
C. Discuss the different types of OCPD's and their applications.
D. Demonstrate the principles of grounding and bonding of an electrical circuit.
E. Identify effective leadership skills and the impact it has on their success.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*

1. Demonstrate the steps to completing an Energized Work Permit with 100% accuracy.
2. Demonstrate how to calculate short-circuit currents with 100% accuracy.
3. Demonstrate how to properly determine and use Personal protective equipment.
4. Demonstrate the ability to Identify Overcurrent protective device categories with 100% accuracy.
5. Recognize the concepts of ground fault current protection of equipment.
6. Compare the difference between grounding and bonding and how they relate to one another.
7. Identify the different types of grounding electrodes and how they are connected.
8. Demonstrate how to size grounding electrode conductors with 100% accuracy.
9. Discuss the difference of ground fault protection of personnel and equipment.
10. Examine the costs associated with owning an electrical contracting company.
11. Demonstrate the importance of communication in the workplace.

12. Recognize the importance of planning and communication has on the success of a project.

B. General Education Learning Outcomes (GELOs)

1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
Outcome 3: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

IV. CONTENT/TOPICAL OUTLINE

A. SECTION 1

1. Introduction to NFPA 70E
2. Justification, assessment, and implementation of energized work.
3. Bolted and arcing fault current and reading time-current curves.
4. Methods to accomplish the arc flash risk assessment.
5. Maintenance consideration and OCPD work practices.
6. Electrical system design and upgrade considerations.

B. SECTION 2

1. Purpose of overcurrent protection and types of overcurrent.
2. Overcurrent protective device categories.
3. Overcurrent protective device ratings.
4. Types of OCPD's – circuit breakers.
5. Types of OCPD's – fuses.
6. Practical guidelines for OCPD ampere rating sizing.
7. Special conductor overcurrent protection permitted, including taps.
8. Calculation of fault currents.
9. Ground-fault protection of equipment.

C. SECTION 3

1. Introduction to grounding and bonding.
2. Circuit basics and overcurrent protection.
3. Code arrangement an application.
4. Grounding electrodes and the grounding electrode system.
5. Requirements for services and grounded conductors.
6. Grounding electrode conductors.
7. Bonding requirements.
8. Equipment grounding conductors (EGC's)
9. Grounding electrical equipment.
10. Isolated (insulated) grounding circuits and receptacles.

D. SECTION 4

1. Grounding at separate buildings or structures.
2. Grounding electrical systems.
3. Grounding requirements for separately derived systems.
4. Special occupancies and conditions.
5. Grounding special equipment.
6. Grounding and bonding for communications systems and equipment.
7. Ground-fault circuit interrupters (GFCI) and Ground-fault protection of equipment (GFPE).
8. Grounding rules for medium-and high-voltage systems.
9. Grounding systems and earth ground test instruments.

E. SECTION 5

1. The contracting business.
2. Personal qualities: Professionalism and respect.
3. Personal qualities: Credibility and character.

4. Personal qualities: Ethics and integrity.
5. Personal qualities: Teaching and learning.
6. Planning: The importance of planning.
7. Planning: Planning challenges
8. Communications: Effective communication.
9. Communications: Crew support and morale.
10. Communications: Disruptive behaviors.
11. Communications: Addressing conflict.

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. *Applied Grounding & Bonding Textbook -2020 Edition – NJATC*
2. *Commercial Blueprint Sets- NJATC*
3. *Effective Leadership Skills Textbook –NJATC*
4. *Fire Alarm Systems Textbook – NJATC*
5. *Instrumentation SW Kit Complete – NJATC*
6. *(Kit includes: Fundamentals of Instrumentation 2 ed.-NJATC)*

B. Textbooks from previous required classes:

1. *Transformer Principles and Applications Textbook –NJATC*
2. *Electrical Safety Related Work Practices – NJATC*
3. *Blueprint Reading for Electricians Textbook– NJATC*
4. *NFPA 70 National Electrical Code -2020 Edition, Textbook-NJATC*
5. *Test Instruments Textbook- NJATC*
6. *Test Instruments Applications Manual- NJATC*
7. *Rigging, Hoisting & Signaling Practices Textbook - NJATC*
8. *Ugly's Electrical References Book -2020 Edition – NJATC*
9. *AC Theory -NJATC*
10. *Hazardous Locations –IAEI & NJATC*

C. Other Resources: Instructor handouts**,** National Electric Code (NFPA 70 NEC-2020 Edition) and References available at the Lincoln Electrical Joint Apprenticeship and Training Committee Training Center.

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture
2. Discussions
3. Demonstration

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Quizzes
2. Tests and Exams

VIII. SPECIFIC COURSE REQUIREMENTS

A. The students will maintain an average of 75% (C) or more on the quizzes, tests and exams or the IBEW will drop them from the program.