

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

ELECTRICAL SAFETY CODES
EET 1410

Class Hours: 1
Laboratory Hours: 0

Credit Hours: 1
Date Revised: Fall 2016

Catalog Course Description

This course provides an interpretive survey of various codes as applied to the electrical construction industry, including the National Electrical Code (NFPA 70) with discussion of related safety organizations and their guidelines, including OSHA, IEEE, IEC, ISA, ANSI, and UL. Articles discussed include conductors, raceways, grounding, arc flash safety, short circuit and ground fault protections, and overload protection, along with various circuit protection devices and schemes.

Prerequisites:

None

Co-requisites:

None

Textbook(s) and Other Course Materials:

Textbook:

Applied Codeology, Latest edition, Thomson - Delmar Learning.

National Electrical Code. Latest edition, National Fire Protection Agency.

Week/Unit/Topic Basis:

Week	Topic
1	Introduction: Electrical Safety
2	National Electrical Code: Table of Contents
3	National Electrical Code: Arrangement
4	National Electrical Code: Structure
5	National Electrical Code: Key Words
6	National Electrical Code: Article 90
7	National Electrical Code: Chapter 1
8	National Electrical Code: Chapter 2
9	National Electrical Code: Chapter 3
10	National Electrical Code: Chapter 4
11	National Electrical Code: Chapter 5-8
12	GFCI and ARC Flash
13	NEMA: Enclosures and Electrical Housings
14	IEEE, IEC, ISA, ANSI, and OSHA
15	FINAL EXAM

Engineering Technology General Outcomes (Educational objectives)

- I Apply basic engineering theories and concepts creatively to analyze and solve technical problems.
- II Utilize with a high degree of knowledge and skill equipment, instruments, software, and technical reference materials currently used in industry.
- III Communicate effectively using developed writing, speaking, and graphics skills.
- IV Assimilate and practice the concepts and principles of working in a team environment.
- V Obtain employment within the discipline or matriculate to a four year program in engineering or industrial technology.

Engineering Technology Concentration Competencies

NOTE: At the program level all 6 competencies apply to roman numerals I – V of the Engineering Technology General Outcomes (Educational objectives) listed above.

Students will:

- A Apply the knowledge, techniques, skills, and modern tools for the concentration of study to specifically defined engineering technology activities
- B Demonstrate the knowledge of mathematics, science, engineering and technology to engineering technology problems using developed practical knowledge
- C Conduct and report the results of standard tests and measurements, and conduct, analyze and interpret experiment or project results
- D Function effectively as a member of a technical team
- E Identify, analyze and solve specifically defined engineering technology-based problems
- F Employ Written, oral and visual communication in a technical environment

Course Goals:

NOTE: Capital letters after course goals reference the competencies of the Engineering Technology concentrations listed above.

The course will

1. Enhance student understanding of the importance of electrical safety. (A, B)
2. Enhance student understanding of the National Electrical Code. (A)
3. Enhance student understanding Authority Having Jurisdiction. (A)
4. Enhance student understanding of the importance of conductor selection. (A, E)
5. Enhance student understanding of the basic principles of raceway system applications. (A, E)
6. Improve student ability to identify various utilization voltages for electrical systems. (A, B, E)
7. Enhance student understanding of the basic concepts of grounding. (A, B, E)
8. Enhance student understanding of the importance of Short Circuit and Overload protection. (A, B, E)
9. Enhance student understanding of the importance of Ground Fault and Arc Flash protection.(A, B, E)
10. Improve student ability to identify the electrical safety component of the Occupational Safety & Health Administration regulation. (A)
11. Improve student ability to recognize various testing agencies. (A)

12. Improve student ability to identify the basic codes and standards that relate to electrical safety. (A)
13. Enhance student understanding of equipment and enclosure ratings. (A)

Expected Student Learning Outcomes

NOTE: Numbers after Expected Student Learning Outcomes reference the course goals listed above.

The student will

- a. Identify the importance of electrical safety. (1)
- b. Understand basic terms in the NEC and identify the various codes, standards, and testing laboratories for the electrical industry. (1, 2, 3, 10, 11, 12)
- c. Identify standard power system utilization voltages. (6)
- d. Identify and explain conductor tables in the NEC. (4)
- e. Identify and apply the raceway tables of the NEC. (5)
- f. Calculate power, power factor, and energy. (1, 2)
- g. Identify the portions of the NEC that relate to over-current and short circuit protection. (8)
- h. Explain the tables that relate to sizing over-current and short circuit protective devices. (8)
- i. Explain the difference between an over-current and short-circuit situation. (8)
- j. Identify over-current and short-circuit protective devices. (8)
- k. Understand the difference in continuous rating and interrupt rating. (8)
- l. Identify the proper code that addresses arc flash. (9)
- m. Explain why equipment must be labeled for arc flash. (9)
- n. Explain energy levels, protective equipment and distances as related to arc flash. (9)
- o. Explain what is meant by ground fault. (9)
- p. Identify ground fault protective devices. (9)
- q. Understand basic grounding concepts. (7)
- r. Explain various electrical enclosure ratings. (1, 12, 13)
- s. Identify some application & safety standards published by the IEEE. (1, 12)

Evaluation

Testing Procedures - 100% of grade

Homework	30%
Quizzes:	40%
Research paper	10%
Final Exam	20%

Laboratory - None

Field Work - None

Other Evaluation Methods: None

Grading Scale:

A	93 - 100
B+	88 - 92
B	83 - 87
C+	78 - 82
C	70 - 77
D	60 - 69
F	Below 60

Policies

Attendance Policy

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

Academic Dishonesty

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.

- Any of the above occurring within the Web or distance learning environment. Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](#) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.