

PELLISSIPPI STATE COMMUNITY COLLEGE  
MASTER SYLLABUS

**APPLIED ELECTRICITY**  
**EET 2655**

**Class Hours: 3**

**Credit Hours: 4**

**Laboratory Hours: 3**

**Date Revised: Fall 2016**

**Catalog Course Description**

This introductory course in the design of residential and commercial electrical systems covers basic principles of electricity, electrical wiring methods, code interpretation, service requirements, utilization voltages, print reading, electrical circuit design and three-phase power applications for commercial systems. Additional topics include electrical power generation, transmission and distribution, as well as distributed generation systems using alternative energy sources.

**Prerequisites**

None

**Corequisites**

None

**Textbook(s) and Other Course Materials**

***Required***

*Electrical Wiring, Residential.* Ray C. Mullin, Delmar, latest edition.

*National Electrical Code*, latest edition.

***Reference***

*Electrical Wiring, Commercial.* Ray C. Mullin, Delmar, latest edition.

**Week/Unit/Topic Basis**

**Week      Topic**

- 1    *Introduction*
- 2    DC/AC Circuits & Battery Applications
- 3    Power Systems: Generation, Transmission, Distribution
- 4    Electrical Safety/Intro to NEC
- 5    Utilization Voltages Electrical Symbols and Outlets
- 6    Electrical Drawings & Symbols
- 7    Conductors
- 8    Wiring Methods: Boxes

- 9 Wiring Methods: Feeder Size...Number of Circuits
- 10 Wiring Methods: Service
- 11 Wiring Methods: Receptacles
- 12 Wiring Methods: Protection/GFCI/AFCI
- 13 Wiring Methods: Raceways
- 14 Other Codes & Standards
- 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 basic electricity. (A, B, C)
2. Enhance student understanding of basic units of electricity. (A, B, C)
3. Enhance student understanding of the generation and distribution of electricity. (A, B, C)
4. Enhance student understanding of common electrical wiring methods. (A, B, C)
5. Improve student ability to identify the codes and regulations that govern electrical installations. (A, B, C)
6. Enhance student understanding of the process of electrical design of residential buildings.(A, B, C)
7. Enhance student understanding of the process of electrical design of commercial buildings.(A, B, C)
8. Improve student ability to recognize the characteristics of related industrial power systems.(A, B, C)
9. Enhance student understanding of the importance of circuit protection. (A, B, C)
10. Demonstrate, as an individual and as a team member, library/information skills, time management skills, problem-solving skills, material management skills, and communication skills. (D, F)

## **Expected Student Learning Outcomes**

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

The student will

- a. Explain the theory of electricity. (1, 6, 7)
- b. Explain the basic terminology and units of electricity. (1, 2, 6, 7)
- c. Explain the basic electrical equations. (1, 2, 6, 7)
- d. Explain the characteristics of series and parallel circuits. (1, 2, 3, 4, 6, 7)
- e. Define AC & DC current and typical sources of each. (1, 3, 7)
- f. Define the principle of "electromagnetic induction". (1, 3, 7)
- g. Explain the phase-time relationship between cycles of an alternating current. (1, 3, 7)
- h. Demonstrate the principles of transformer operation. (1, 3, 7, 10)
- i. Demonstrate the standard methods of sizing electrical conductors. (1, 3, 4, 5, 6, 7, 8, 10)
- j. Explain the common design factors which affect conductor ampacity. (1, 2, 3, 4, 5, 6, 7)

- k. Define conductor insulations, designations and characteristics. (1, 2, 3, 4, 5, 6)
- l. Demonstrate the methods of electrical wiring, applications and characteristics of each. (4, 5, 6, 7, 10)
- m. Explain the methods of conductor enclosures, applications and characteristics. (4, 5, 6, 7)
- n. Explain the concept of "grounded" electrical conductors. (3, 4, 5, 6, 7)
- o. Demonstrate the concept of "equipment grounding." (3, 4, 5, 7, 7, 10)
- p. Explain the "N.E.C." regulations governing color coding. (3, 5, 6, 7)
- q. Demonstrate how to wire the standard types of electrical receptacles. (3, 4, 5, 6, 7, 10)
- r. Demonstrate how to wire the standard types of lighting outlets & fixtures. (3, 4, 5, 6, 7, 10)
- s. Demonstrate the common methods of providing overload protection to electrical circuits.(3, 4, 5, 6, 7, 10)
- t. Identify the "N.E.C." regulations governing the design of feeder and branch circuits. (3, 4, 5, 6, 7)
- u. Explain the "N.E.C." regulations governing the design of service entrance components. (3, 4, 5, 6, 7)
- v. Explain the "N.E.C" regulations governing the installation of electrical circuits and fixtures.(3, 4, 5, 6, 7)
- w. Explain the procedures for illumination design. (2, 3, 6, 7)

## Evaluation

### Testing Procedures: 80% of grade

Chapter Tests	40%
Quizzes	10%
Project Report	10%
Final Exam	20%

### Laboratory Expectations: 20% of grade

The laboratories for all EET courses are an essential part of conveying the concepts to the student. The labs would closely follow the classes in content and in time of presentation so that the student is actually verifying these concepts to his or her self. The student will be able to apply the theory learned in class. The laboratory grade will be determined by a combination of performance within the lab and the quality and demonstrated comprehension of the lab report. There will be at least twelve labs during the semester to go along with the classroom material.

Performance in labs (subjective)	50%
Lab Reports (neatness and content)	30%
Laboratory Test	20%

### Field Work:

None

**Other Evaluation Methods:**

None

**Grading Scale:**

93 – 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
70 – 77	C
60 - 69	D
0 - 59	F

**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/) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.