Class Hours: 0        Credit Hours: 1
Laboratory Hours: 3   Revised: Fall 2012

Catalog Course Description:

Emphasis on introduction to electronic equipment, components, and software, focusing on the application of the multimeter, oscilloscope, function generator, power supply, and circuit simulation software. Practical soldering techniques are introduced and practiced. Discussion includes modern electronic systems, such as a microcontroller and a variety of electronic sensors, and an introduction to robotics.

Entry Level Standards:

The student needs only an interest in electronics.

Prerequisites:

None

Co-requisites:

None

Textbook(s) and Other Course Materials:

None required. Student will be required to purchase Electronic Trainer Kit to be constructed as part of the course. Approximate cost: $30.00.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture: How to Solder and Construct the Digital Multimeter</td>
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<tr>
<td>2</td>
<td>Lecture: Introduction to Professional Ethics Construction of Digital Multimeter Section A</td>
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<tr>
<td>3</td>
<td>Lecture: Introduction to Schematics and Symbols Test of Digital Multimeter Section A</td>
</tr>
<tr>
<td>4</td>
<td>Lecture: Introduction to Engineering Prefixes/Units Construction of Digital Multimeter Section B</td>
</tr>
<tr>
<td>5</td>
<td>Lecture: Resistors and Color Code Test of Digital Multimeter Section B</td>
</tr>
<tr>
<td>6</td>
<td>Lecture: Multimeter and Power Supply Construction of Digital Multimeter Section C</td>
</tr>
</tbody>
</table>
II. 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.

III. Engineering Technology Concentration Competencies*

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
Identify, analyze and solve specifically defined engineering technology-based problems

Employ Written, oral and visual communication in a technical environment

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

IV. Course Goals*:

The course will

1. The course will guide students toward effective use of proper measurement techniques using multimeters. (A, B, C, D, E)
2. The course will guide students toward effective use of oscilloscope operation. (A, B, C, D, E)
3. The course will guide students toward effective soldering techniques. (A, B, C, D, E)
4. The course will guide students toward effective understand schematic layout software. (A, B, C, D, E)
5. The course will expand student understanding the importance of Professional Ethics, time management, and quality work habits. (A, B, C, D, E)
6. The course will guide students toward effective use of function generators. (A, B, C, D, E)
7. The course will guide students toward effective use of a power supply. (A, B, C, D, E)
8. The course will guide students in the proper use of Engineering Units and abbreviations. (A, B, C, D, E, F)
9. The course will guide students toward how to identify resistors by color code. (A, B, C, D, E)

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

V. Expected Student Learning Outcomes*:

Students will: be able to:

a. Take resistance measurements using a multimeter. (1)
b. Take voltage measurements using a multimeter. (1)
c. Take current measurements using a multimeter. (1)
d. Make DC voltage measurements using an oscilloscope. (2)
e. Make waveform measurements using an oscilloscope. (2)
f. Solder components on a printed circuit board neatly (3)
g. De-solder and replace components on a printed circuit board. (3)
h. Draw schematic using available software. (4)
i. Able to make Professional Ethical decisions. (5)

j. Able to manage their time effectively. (5)

k. Able to set up specified waveform on a function generator. (6)

l. Able to setup a specified voltage on a power supply. (7)

m. Able to express all numbers in Engineering units. (8)

n. Able to use Engineering numbers in calculations. (8)

o. Able to select resistors based on color code. (9)

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

VI. Evaluation:

A. Testing Procedures: 50% of grade

Quizzes 30%
Final Exam 20%

B. Laboratory Expectations: 50% of grade

40% · Completion of the Digital Multimeter will provide 40% of the final grade.
10% · Completion of four basic programs – each worth 2.5%

C. Field Work:

Students shall participate in one class field trip. A report will be required that will be part of the laboratory grade.

D. Other Evaluation Methods:

None

E. Grading Scale:

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

VII. Policies:

A. 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.

B. 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.

C. Accommodations for disabilities:

Students, who 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 Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at [http://www.pstcc.edu/sswd/](http://www.pstcc.edu/sswd/).