

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE

**INTRODUCTION TO SECURITY AUTOMATION  
SEAT-1400**

**Class Hours: 3.0**

**Credit Hours: 4.0**

**Laboratory Hours: 3.0**

**Revised: Fall 2005**

**Catalog Course Description:**

An introductory course in security automation. The student will be introduced to basic electrical theory as applied to security systems. The student will be introduced to different sensor technologies, as well as intrusion control, access control, and CCTV systems, with an emphasis on applications. Wiring practices is also covered.

**Entry Level Standards:**

The student must have college level standing in mathematics.

**Prerequisites:**

EET 1012 or approval of the instructor

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

*The complete book of Electronic Security*, Bill Phillips McGraw Hill, New York, NY 2002  
Parts Kit: Approximate Cost \$20.00.

**I. Week/Unit/Topic Basis:**

The following is intended as a guide to the instructor. The material covered in the course may be changed by the instructor depending upon the progress, etc., of the class.

<b>Week</b>	<b>Topic</b>
1	Introduction to the Security Industry
2	Basic Electrical Theory
3	Basic Electrical Theory
4	Relay logic and Applications
5	Sensors
6	Sensors

- 7 Intrusion Control Systems
- 8 Intrusion Control Systems
- 9 Access Control Systems
- 10 Access Control Systems
- 11 CCTV
- 12 CCTV
- 13 Wiring Practices (Conductor types and sizing charts)
- 14 Wiring Practices (Installation practices)
- 15 Review and final exam.

## II. Course Objectives:

- A. Understand basic electrical theory as applied to security systems. I, II
- B. Understand the operation and application of security sensor technology I, II
- C. Understand the operation of Intrusion Control Systems. I, II
- D. Program and configure an intrusion control system controller. I, II
- E. Understand the operation and application of an Access Control System. I, II
- F. Program and configure an access control system controller with two door access. I, II
- G. Understand the operation of a CCTV control system. I, II
- H. Understand basic wiring practices as applied to security systems. I, II,
- I. Demonstrate, as an individual and as a team member, library/information skills, time management skills, problem-solving skills, material management skills, and communication skills. I, II, III, IV, IX, X

## III. Instructional Processes:

Students will:

1. Participate in classroom discussions which challenge their abilities to think creatively and visualize complex spatial and mathematical relationships to solve problems. *Mathematics Outcome*
2. Work in teams to conduct laboratory experiments and also to solve special problem assignments. These activities are designed to foster interpersonal skills in teamwork and develop and enhance leadership skills, students' abilities to express ideas, and students'

abilities to reach consensus solutions for the team through negotiation. *Communication Outcome; Mathematics Outcome; Active Learning Strategy*

3. Use electronic test equipment to test electrical circuits constructed from schematics in the laboratory and acquire data. Use computers with applications software to simulate, analyze, and predict the behavior of electrical circuits. Compare expected responses to experimental responses of electrical circuits. Use the Internet for special assignments such as locating data sheets on electronic components. Use computers with word processing software to prepare reports. *Communication Outcome; Mathematics Outcome; Technological Literacy Outcome*
4. Prepare reports on laboratory experiments which include methodology, mathematical analyses of electrical circuit models, a comprehensive comparison of calculated results with experimental results, and conclusions. *Communication Outcome; Mathematics Outcome; Technological Literacy Outcome*
5. Discuss the importance of personal qualities such as personal responsibility, time management principles, self-esteem, sociability, self-management, integrity and honesty in school and in the workplace, and dynamics of change in the workplace. *Social and Behavioral Science Outcome; Transition Strategy*

#### **IV. Expectations for Student Performance\*:**

Upon successful completion of this course, the student should be able to:

1. Analyze a series circuit. A
2. Analyze parallel circuit. A
3. Measure DC and AC Voltage and Current using a DMM. A
4. Measure resistance using a DMM. A
5. Apply relay technology. A
6. Understand the difference between a Normally Open and Normally Closed contact. . A
7. . Understand basic logic functions using relays, such as AND, OR, and NOT functions. A
8. Identify different sensor technologies used in the security industry. B
9. Identify the basis of operation of different sensor technologies. B
10. Understand the application of different sensor technologies. B
11. Identify ANSI symbols for electrical devices used in electrical schematics.. A
12. Understand the basic operation of an intrusion control system . C, D
13. Interface sensors with an intrusion control system. B, C, D
14. Explain the purpose and advantages of an end-of-line resistor. A, B, C, D

15. Apply an end-of-line resistor to an intrusion control system. A, B, C, D
16. Configure an intrusion controller. C, D
17. Understand the basic operation of an access control system.. E, F
18. Interface door locks and sensors with an access control system. E, F
19. Configure an access controller with two doors. E, F
20. Profile a group of users for an access controller. E, F
21. Integrate an alarm monitoring system with an access controller. E, F
22. Explain the basic operation of a Closed Circuit TV system. G
23. Identify different methods of triggering the recording for a CCTV system. G
24. Recognize common wiring practices consistent with the NEC. B
25. Understand basic codes and regulations applied to security control systems. B
26. Recognize basic NBFAA installation standards and practices for security systems. B
27. Identify different types of cables used in security systems. H
28. Perform power calculations for an intrusion control system. H
29. Size wire and transformers of a power supply for an intrusion control system.. H

\*Letters after performance expectations reference the course objectives listed above.

## V. Evaluation:

### A. Testing Procedures: 80% of grade

The evaluation in the classroom grade will be determined by a combination of tests, homework, and a final exam. Pop quizzes may also be used at the discretion of the instructor. The percentage that each of these factors count and the frequency of quizzes, tests and homework is left to the discretion of the instructor, but the following is offered as a guide:

Tests:	3- 4 tests	60%
Homework and Quizzes		20%
Final Exam:		20%

### B. Laboratory Expectations: 20% of grade

The laboratory grade will be determined by a combination of performance (including teamwork) within the lab and the degree of comprehension demonstrated in the lab report. There will be at least twelve labs during the semester to go along with the classroom material. The following is offered as a guide for the instructor:

Performance in labs (subjective)	20%
Lab Reports (neatness and content)	60%

## Laboratory Quiz

20%

Laboratory topics may vary at the discretion of the instructor, but will be related in a timely manner to the course work. The following list of topics is suggested:

- A. Series Circuits
- B. Parallel Circuits
- C. Relay Applications
- D. Sensor Applications
- E. Sensor Applications
- F. End of Line Resistor
- G. Intrusion Control Configuration
- H. Intrusion Control Project
- I. Access Control Configuration
- J. Access Control Project
- K. Access Control Project Cont'd
- L. CCTV Applications

### C. Field Work:

N/A

### D. Other Evaluation Methods:

N/A

### E. Grading Scale:

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

## **VI. Policies:**

### A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all 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 and Student Affairs, may have requirements that are more stringent.

Unexcused absences and class or lab work not made up in a timely manner may very well result in a reduced grade for the course or in failure of the course. It is the student's responsibility to be present when the instructor informs the class of attendance and work requirements, or otherwise the student must contact the instructor for this information.

Attendance is required to all lab sessions unless excused by the instructor. Students missing more than four unexcused sessions will receive an "F" and no credit will be received. Students tardy past half an hour will be considered absent.

### B. Student Conduct:

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. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.