ELECTRICITY AND AUTOMATION

Course Syllabus

Revised 12/01/2011

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COURSE NUMBER: AMT 206

PREREQUISITE(S): None

CO-REQUISITE(S): None

COURSE DESCRIPTIONS

This course progresses from introduction to principles of automation, including a study of various mechanical devices used in automated manufacturing and electrical components used to control the machines. Lab projects include design, fabrication, and operation of various real and simulated processes.

TEXTBOOK(S):

Bartelt, Terry, Industrial Control Devices*. Albany, New York Delmar/Thomson Learning*, 2002.

REFERENCE(S):

Course information and support materials found on the AMT lecture site: http://lecture.sccsc.edu/amt

OTHER REQUIRED MATERIALS, TOOLS, AND EQUIPMENT:

Safety Glasses-for use in lab
5x8 Index Cards
2 Binding Rings-used to create an individual reference guide
1 USB jump drive for project file and/or program storage.

INSTRUCTOR ASSISTANCE:

All students are encouraged to contact the instructor as course or advising needs arise. The best way to do this is to see the instructor after class to schedule an appointment and/or look at the office hours schedule posted on the instructor's office door. You can also contact the instructor using email.

METHOD OF INSTRUCTION:

This course will be taught by instructor led discussion, lecture, small group dialogue, whole class participation, individual instruction, appropriate active learning strategies, teaming activities, and hands on lab projects. Learning will be reinforced through written homework assignments that are posted on the AMT lecture site.

GRADING SYSTEM:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
60	-	69	=	D
Below	-	60	=	F

GRADE CALCULATION METHOD:

Written Homework	=	40%
Lab Projects	=	30%
Class Participation	=	20%
Research Projects	=	10%
	=	100%

ATTENDANCE POLICY:

Students are responsible for punctual and regular attendance in all classes, laboratories, field trips, and other class activities. The College does not grant excused absences; therefore, students are urged to reserve their absences for emergencies. When illness or other emergencies occur, the student is responsible for notifying instructors and completing work missed.

Students are tardy if not in class at the time the class is scheduled to begin. Tardy students are admitted to class at the discretion of the instructor.

If you have attended at least one session during the first week of the semester you are responsible for dropping yourself from the class. It is the students' responsibility to withdraw from a course. A student who stops attending class and fails to initiate a withdrawal will remain on the class roster.

If you do not attend a class session during the first week of class you will automatically be dropped by the College.

A student who does not complete an assignment, test, or final exam in the course will receive a zero for each missing grade and the final course grade will be calculated accordingly.

Absences for Religious Holidays: Students who are absent from class in order to observe religious holidays are responsible for the content of any activities missed and for the completion of assignments occurring during the period of absence. Students who anticipate their observance of religious holidays will cause them to be absent from class and do not wish such absences to penalize their status in class should adhere to the following guidelines:

1. Observance of religious holidays resulting in three or fewer consecutive absences: Discuss the situation with the instructor and provide written notice at least one week prior

to the absence(s). Develop (in writing) an instructor-approved plan which outlines the make-up of activities and assignments.

2. Observances of religious holidays resulting in four or more consecutive absences: Discuss the situation with the instructor and provide the instructor with written notice within the first 10 days of the academic term. Develop an instructor-approved plan which outlines the make-up of activities and assignments.

ACADEMIC CONDUCT:

ACADEMIC DISHONESTY: Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

CELLULAR PHONES AND PAGERS/BEEPERS: Cellular phones, pagers and beepers are not permitted to be turned on or used within the classroom. Use of these devices during classroom time will be considered a violation of the student code as it relates to “disruptive behavior.”

CLASS/LAB PROCEDURES:

Students are required to do original work on graded exercises. They are expected to bring all necessary equipment, texts, etc. to classes and labs. Labs and field trips are scheduled/performed for the experience of the endeavor; therefore attendance is mandatory for a grade. Work or other conflicts that affect the student’s attendance may be worked out with the instructor in advance of the scheduled lab/ fieldtrip, however credit for attendance will not be given unless the student either attends class or has completed all scheduled coursework for the semester. Most labs are conducted in a teaming format wherein the students do data gathering and repetitive calculations as a group, but formal lab reports are to be original and done by the individual. Class participation is strongly encouraged in this course, therefore students in regularly scheduled classes will be awarded points per class session for timely and complete attendance. (Come on time; stay till done). In this way, class participation can

affect the final grade by at least two whole letter grades. .

ACCOMMODATIONS: Students who need special accommodations in this class because of a documented disability should notify Student Disability Services by calling (864) 592-4818, toll-free 1-800-922-3679; via email through the SCC web site at www.sccsc.edu/resources/disabilities; or by visiting the office located in the East Building Room 30-B on the SCC Central campus. Contacting Student Disability Services early in the semester gives the College an opportunity to provide necessary support services and appropriate accommodations.

COURSE COMPETENCIES & OBJECTIVES:

Upon satisfactory completion of this course, the student will be able to:

I. Identify the components and explain the operation of the major internal parts of a process controller.
   1. Explain the purpose and list the features of various types of internal controller components.
   2. Describe the difference between the following types of controllers: Low-technology, Medium-technology and High-technology.
   3. List and explain the operation of five different types of controller boards.
   4. List the sequence of events in the signal path control of an automated system.

II. Develop and demonstrate the execution of a system program.
   1. State the purpose for the two basic programs used in controllers.
   2. Demonstrate the process of developing a program.
   3. Define the importance of flowcharting a program.
   4. Construct a flowchart and program concept into machine codes.

III. Identify various sensors used in instrumentation and explain their relationship to transducers.
   1. Demonstrate an understanding of analog and digital signals.
   2. Demonstrate the actions occurring in a comparator.
   3. Demonstrate knowledge of control algorithms.
   4. Explain how a closed loop control system functions the control a process variable.

IV. Analyze a process control system operation and select the appropriate sensing equipment for that operation.
   1. Describe the purpose of various types of sensors.
   2. Propose and implement the use of sensors intelligent input to a system program.
   3. Observe the operation of various sensors on a CIM system.