Course Syllabus

Department: Science and Technology

Date: 01-15-2013

I. Course Prefix and Number: ESC 210

   Course Name: Engineering Design I

   Credit Hours and Contact Hours: 2 credit hours and 4 contact hours

   Catalog Description including pre- and co-requisites: supporting data required for grade prerequisite of ‘C’ or higher. This course is the first part of a two-course sequence in engineering design. The students will work in teams. Topics include: Engineering design principles, fundamentals of microcontrollers, sensors, electric motors, engineering materials, mechanical systems, circuit board design, and manufacturing concepts. Prerequisite: None.

   Relationship to Academic Programs and Curriculum including SUNY Gen Ed designation if applicable:

   This course is primarily a required course for the A.S. in Engineering Science program. Other students from other programs may also take the course if they have the appropriate background.

II. Course Student Learning Outcomes: State the student learning outcome(s) for the course (e.g. Student will be able to identify...)

   Upon completion of the course the student will be able to:

   1. Program a microcontroller to perform simple tasks
   2. Use basic machine tools to create prototype designs
   3. Identify engineering materials suitable for a given application
   4. Use position sensors and electric motors effectively in an engineering design project

College Learning Outcomes Addressed by the Course: (check each College Learning Outcome addressed by the Student Learning Outcomes)

☐ writing  ☑ computer literacy
☐ oral communications  ☐ ethics/values
☐ reading  ☐ citizenship
☐ mathematics  ☐ global concerns
☑ critical thinking  ☐ information resources
III. Assessment Measures (Summarize how the college and student learning outcomes will be assessed): For each identified outcome checked, please provide the specific assessment measure.

<table>
<thead>
<tr>
<th>List identified College Learning Outcomes(s)</th>
<th>Specific assessment measure(s)</th>
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</thead>
<tbody>
<tr>
<td>eg: writing</td>
<td>eg: student will complete a research paper</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>Student will complete a series of lab reports</td>
</tr>
<tr>
<td>Computer Literacy</td>
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IV. Instructional Materials and Methods

Types of Course Materials:
No textbook is required for this course. Instructor notes are the main source of information for the course content.
Each student is required to have a calculator (a minimum of TI-83 or equivalent).
All the necessary equipment to carry out the experiments listed for this course is provided by the department.
A course website is maintained on the internet for lecture schedule, problem solutions, and other supplemental learning material.

Methods of Instruction (e.g. Lecture, Lab, Seminar ...):
The instruction is done in a traditional lecture format as well as in the form of coaching student groups through their various assignments and projects. Small class sizes allow instructor to engage the students on a one-on-one basis.
Hands-on approach is emphasized throughout the course. Team work among the students are required.

V. General Outline of Topics Covered:
Fundamentals of engineering design
Microcontroller programming
Position sensors
DC Motors
Stepper motor use and control
Servo motor use and control
Use of machine tools
Material identification