Course Syllabus

Department: Science & Technology

Date: 01-15-2013

I. Course Prefix and Number: ESC 220

   Course Name: Engineering Design II

   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 a continuation of Engineering Design I. The students will work in teams on an engineering design project. They will design and build a prototype of their project using the principles learned in the first course. Prerequisite: ESC 210.

   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. Use the mechanical principles of engineering in real-life engineering design problems.
   2. Use the electronic principles of engineering in real-life engineering design problems.
   3. Use the manufacturing principles of engineering in real-life engineering design problems.
   4. Complete an engineering design problem from its conceptual stage to its final prototype stage.

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

   ☒ writing
   ☒ oral communications
   ☑ reading
   ☑ mathematics
   ☒ critical thinking
   ☑ computer literacy
   ☑ ethics/values
   ☑ citizenship
   ☒ global concerns
   ☑ 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>
</tr>
</thead>
<tbody>
<tr>
<td>eg: writing</td>
<td>eg: student will complete a research paper</td>
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<tr>
<td>Writing</td>
<td>Student will complete a project report</td>
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<tr>
<td>Oral Communications</td>
<td>Student will do a class presentation</td>
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<tr>
<td>Critical Thinking</td>
<td>Student will keep an engineering journal</td>
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<tr>
<td>Global Concerns</td>
<td>Student will analyze the carbon footprint of the design</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.
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 and other supplemental learning material.

Methods of Instruction (e.g. Lecture, Lab, Seminar …):
This course is entirely a lab course and it does not have a formal lecture component. The students apply the knowledge that they had learned in previous courses to carry out a design and analysis process. The instructor acts as a coach in clarifying the various concepts to the students, in answering questions, and in providing overall guidance.

V. General Outline of Topics Covered:
Fundamentals of engineering design
Microcontroller programming
Position sensors
Electric motor applications
Stepper motor use and control
Servo motor use and control
Use of machine tools
Material identification
Making drive systems
Circuit board etching