EE491

Engineering Design/Analysis

A Special Inter-Disciplinary Class for Senior Electrical Engineering Students on Innovation and Entrepreneurship

Spring Semester 2014

UNIVERSITY
Of NEVADA
Reno

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EE 491  Engineering Design/Analysis

Spring Semester 2014 Catalog Data

About EE 491:  Engineering Design/Analysis, 4 Credits

Invention, innovation, entrepreneurship, and design of products. Proposal writing, design, and fabrication procedures used by industry. This is major Capstone Course.

Prerequisites: ENG 102, CH201 or 202 or 203, EE221, 320R, 490. Junior or senior standing.

Time/Location:  MWF  11:00-11:50 /  MS 215
               Friday   1:00-5:00 / SEM 341

Text Books (recommended):


Objectives:

This class is a major capstone class. The objectives of this class are as follows:

(1) To provide students with an understanding of the fundamental knowledge prerequisite for the practice of, or for advanced study in, electrical engineering, including its scientific principles, rigorous analysis, and creative design.
(2) To provide students with the broad education, including knowledge of important current issues in engineering with emphasis on electrical engineering, necessary for productive careers in the public or private sectors or for the pursuit of graduate education.
(3) To develop skills for clear communication and responsible teamwork, and to implant professional attitudes and ethics, so that students are prepared for the complex modern work environment and for lifelong learning.
(4) To provide an environment that enables students to pursue their goals in an innovative program that is rigorous and challenging, open and supportive.
Student Learning Outcomes (ABET):  a, b, c, d, e, f, g, h, i, k

a. Students will be able to apply knowledge of mathematics, science, and engineering.

b. Students will be able to design and conduct experiments, as well as analyze and interpret data.

c. Students will be able to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

d. Students will be able to function on multidisciplinary teams.

e. Students will be able to identify, formulate, and solve engineering problems.

f. Students will be able to understand professional and ethical responsibilities.

g. Students will be able to communicate effectively.

h. Students will be able to demonstrate the understanding of the impact of engineering solutions in a global, economic, environmental, and societal context.

i. Students will be able to recognize the need for, and will be able to engage in, life-long learning.

k. Students will be able to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Evaluation (tentative):

Presentations and reports: 40%
Attendance: 15%
Lab performance: 20%
Final presentation and report: 25%

Grading Scale (tentative):

A 93-100  C 65-69
A- 88-92  C- 61-64
B+ 84-87  D+ 58-60
B 80-83  D 55-57
B- 75-79  D- 50-54
C+ 70-74  F <50

Disability Statement:

If you have a disability for which you need academic adjustments or accommodations, please contact me or staffs at the Disability Resource Center (Thompson Building, Suite 101).

Academic Dishonesty Statement:

Any student found cheating in any presentation, report, prototype development, quiz, or exam, will fail the class besides standard UNR penalties. Detailed UNR policy can be found in http://www.unr.edu/student-conduct/policies/university-policies-and-guidelines/academic-standards/policy

Audio/video Recording Statement:
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

**Late Submissions:**

Late submission of report will have a deduction of 10% of the grade per late day, to a maximum of two late days for each submission. No material will be accepted after two days if past the deadline. For example, an assignment that is 80 points will get 80*0.9=72 if it is one day late, 80*0.8=64 if it is two days late. For the special case, please contact me ASAP.

**Summary and Schedule:**

This is a very demanding and time-consuming class. The students must adhere to class rules and are expected to devote a significant amount of time for working on their projects. The students are expected to develop their engineering skills and to show rich **engineering judgment, perseverance, and determination** in solving the problems and completing their projects. The students are encouraged to be **open-ended and creative**. Completing the project and the technical report in all their details is a sine-qua-non condition for succeeding in this class.

The students are separated into companies with no more than 5 persons in each group, called companies. Each company will choose an **ORIGINAL PROJECT** and will build that product. The students in each company will be involved in project management, technical design and product manufacturing problems.

The company can earn a maximum of 10,000 points allocated as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>Task</th>
<th>Max. Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3,4,5</td>
<td>Choose/generate the project, prepare written business proposal and present to class.</td>
<td>2,000</td>
</tr>
<tr>
<td>6,7,8,9,10</td>
<td>Order materials/parts, evaluation kits, breadboard system. Consider design problems and solutions, and packaging of final product. Submit progress reports 1, 2.</td>
<td>3,000</td>
</tr>
<tr>
<td>11,12,13</td>
<td>Breadboard/test-bed complete, finish prototype/product</td>
<td>2,000</td>
</tr>
<tr>
<td>14,15,16</td>
<td>Complete project and come out prototype/product, prepare final report or paper. Present completed project to faculty, invited guests, and award committee. Attend final exam.</td>
<td>3,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>10,000</strong></td>
</tr>
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