Syllabus

Engineering Technology
University of North Texas
Course Title: Senior Design I
Course Prefix and Course Number:
ELET 4780
Semester: Fall 2014

The Engineering Technology Department, in cooperation with the Office of Disability Accommodation, complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request to the instructor prior to the fourth day.

SAFETY CATEGORY: N
DATE PREPARED: August 23, 2014
PREPARED BY: Dr. Elias Kougianos.

COURSE NUMBER, TITLE, CREDIT HOURS:
ELET 4780, Senior Design I, 1 Credit Hour

DESCRIPTION:
Project teams specify, plan and design a product or process. Oral and written documentation required. Projects to be supplied by local industry whenever possible.

PREREQUISITES:
Senior standing

REQUIRED TEXTBOOKS:
No required text

SUPPLEMENTAL TEXTS AND MATERIALS:
Use of all texts and material from prior ETEC, technical writing and presentations courses.

COURSE OBJECTIVES: At the conclusion of this course, the student will (be able to):

1. Develop a product or process portfolio with a marketing plan.
2. Develop an understanding of the product development cycle from inception to a test model as used in an industrial setting.
3. Develop an appreciation of a team effort in product development.
4. Prepare a formal technical document covering the actual design.
5. Learn the process of utilizing catalogs, specification sheets and vendor documents in the design process.
6. Learn to apply the breath of the major engineering technology courses to the completion of the final design.
7. Develop an appreciation for the requirements and techniques of an oral presentation covering a group effort.
8. Develop an appreciation for the free market system.
APPROPRIATE PROGRAM OUTCOMES:

a. An appropriate mastery of the knowledge and adapt to emerging applications of disciplines,
b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,
c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve
d. An ability to apply creativity in the designing of systems, components or processes appropriate to program objectives,
e. An ability to function effectively on teams,
f. An ability to identify, analyze and solve technical problems,
g. An ability to communicate effectively
h. A recognition of the need for, and an ability to engage in lifelong learning,
i. An ability to understand professional, ethical and social responsibilities,
j. A respect for diversity and a knowledge of contemporary professional,
k. A commitment to quality, timeliness, and continuous improvement.
l. Graduates must demonstrate knowledge and hands-on competencies in the application of the following to the building, testing, operation, and maintenance of electrical/electronic systems:
   circuit analysis and design,
   computer programming,
   associated software,
   analog and digital electronics, and
   microcomputers.
m. Graduates must demonstrate knowledge and hands-on competence in the application of physics or chemistry to electrical/electronics circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry.
n. Graduates must demonstrate the ability to analyze, design and implement:
   control,
   instrumentation,
   communication,
   computer, or
   power systems.
o. Graduates must demonstrate the ability to apply project management techniques to electrical/electronics systems.
p. Graduates must demonstrate the ability to utilize the following in support of electrical/electronics systems:
   Statistics/probability transform method,
   discrete mathematics, or
   applied differential equations.
STUDENT LEARNING OUTCOMES: (TAC of ABET Program Outcomes Addressed)

1. Prepare a formal project proposal in response to either an RFP or a group-initiated concept. (g,k)
2. Design the concept using appropriate electrical and mechanical principles. (a,m,n)
3. Make a formal oral presentation on the initial design and its applications. (g)
4. Write a formal report on initial design of the project. (g, k)
5. Learn to work in a small group design environment. (e)

INSTRUCTIONAL OBJECTIVES

1. Conditions:
   a) Students can use pens, paper, calculator and textbooks during lectures.
   b) Students are allowed to download lectures from the instructor’s website.
   c) Students are permitted to use electronic equipment, software, computer-aided techniques, and parts kits in the laboratory.

2. Criteria:
   a) Students are required to attend lecture classes.
   b) Homework will be turned in on the due date.
   c) Makeup examinations will not be given.

3. Outcome Competencies:
   a) Homework and random quizzes will be used to assess understanding of materials covered in lecture.
   b) Formal presentations will be used to assess understanding of materials covered during the semester in the lecture.

LEARNING STRATEGIES:

This is a design course whereby the students are placed in a simulated industrial environment. Divided into teams they are responsible for designing a product or process and creating a portfolio for implementation in Senior Design II. They must submit weekly progress reports, a project proposal and an initial design report, all of which must be approved by the instructor who functions as a CEO. Course meets formally once each week.
COURSE OUTLINE:

1. Development of an initial concept
2. Preparation of a cost analysis
3. Development of a market plan – or Response to a specific RFP.
4. Preparation and updating of a weekly time schedule
5. Mid-semester oral update reports on the project status.
6. Weekly logs (written progress reports)
7. Preparation of a formal written report covering the design of a product or process.
8. Formal oral presentation by all members of the company on the semester project.

LECTURE SCHEDULE* for FALL 2014 (M 11:30-12:20AM in B158)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M 08/25</td>
<td>Introduction to senior project. Team formation.</td>
</tr>
<tr>
<td>2</td>
<td>M 09/01</td>
<td>NO CLASS (Labor Day).</td>
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<tr>
<td>4</td>
<td>M 09/15</td>
<td>Managing electronic development projects. History of engineering project management from the early 1900s to today. Concurrent engineering. Total quality management. Methods of project management.</td>
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<tr>
<td>6</td>
<td>M 09/29</td>
<td>MIDTERM PRESENTATIONS 1 [Teams 1 &amp; 2]</td>
</tr>
<tr>
<td>7</td>
<td>M 10/06</td>
<td>MIDTERM PRESENTATIONS 2 [Teams 3 &amp; 4]</td>
</tr>
<tr>
<td>8</td>
<td>M 10/13</td>
<td>The six steps: step 1, research and gathering information.</td>
</tr>
<tr>
<td>9</td>
<td>M 10/20</td>
<td>The six steps: step 2, develop design specifications.</td>
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<tr>
<td>10</td>
<td>M 10/27</td>
<td>The six steps: step 3, project scheduling.</td>
</tr>
</tbody>
</table>
The six steps: step 4, the preliminary design, component selection.

The six steps: step 4 cont., prototype development.

FINAL PRESENTATIONS 1 [Teams 1 & 2]

FINAL PRESENTATIONS 2 [Teams 3 & 4]

FORMAL REPORTS DUE

* This lecture outline is subject to change based on students’ lab and class progress.

COMPUTER USAGE:

All relevant Engineering Technology Software.
MS Project

ORAL COMMUNICATION USAGE:

Each student will make an oral presentation utilizing appropriate AV materials on an assigned technical problem
# PRESENTATION GRADING GUIDE:

**PRESENTER NAME** ____________________  **COURSE NAME** ____________________

**SEMESTER** ______   **PROJECT TITLE** ______________________________________

<table>
<thead>
<tr>
<th>EVALUATION TOPIC</th>
<th>POSSIBLE POINTS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subject Introduction</td>
<td>0 1 2</td>
<td></td>
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<tr>
<td>2. Organization of Topics</td>
<td>0 1 2 3</td>
<td></td>
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<tr>
<td>3. Clear Descriptions</td>
<td>0 1 2 3</td>
<td></td>
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<tr>
<td>4. Emphasized Pertinent Information</td>
<td>0 1 2</td>
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<tr>
<td>5. Quality and Effective Use of Visual Aids</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>6. Effective Conclusion</td>
<td>0 1 2 3</td>
<td></td>
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<tr>
<td>7. Composure and Speaking</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>8. Project Technical Content</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
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<tr>
<td>9. Subjective Evaluation</td>
<td>0 1 2 3 4</td>
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**Composite Score** ____________________

**EVALUATOR COMMENTS** ________________________________________________
________________________________________________________________________
________________________________________________________________________
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WRITTEN COMMUNICATION USAGE:

Students will be required to submit written reports on each laboratory assignment. IEEE format is required in preparing the report. All software generated files and reports should be included with the reports.
WRITTEN GRADING GUIDE:

NAME ____________________________ COURSE NAME _____________________

REPORT DATE _______ DUE DATE __________ TEAM ________________________

PROJECT TITLE ___________________________________________________

<table>
<thead>
<tr>
<th>EVALUATION TOPIC</th>
<th>POSSIBLE POINTS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Objective</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2. Diagrams</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. Expected Results</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4. Original Data Sheets</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5. Analysis of Results</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>6. Conclusions</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7. Supportive Data</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8. Comments</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Composite Score __________

EVALUATOR COMMENTS ____________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
LIBRARY USAGE:

Library research assignments requiring a notebook/diary of entries showing dates, times, journals, books, internet resources, and other information researching activities will be required.

GRADING ELEMENTS AND WEIGHTS:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance (individual)¹</td>
<td>10%</td>
</tr>
<tr>
<td>Adherence to schedules (individual and team)²</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm presentation (individual)</td>
<td>25%</td>
</tr>
<tr>
<td>Final presentation (individual)</td>
<td>25%</td>
</tr>
<tr>
<td>Final report (team)</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Notes:
1. Each unexcused missed lecture (or late arrival) incurs a 0.7% penalty. Three unexcused lecture absences will result in the student being dropped from the course by the instructor. A student shall be considered absent if twenty or more minutes late to class.
2. Each missed individual deadline results in a 0.7% penalty for the individual. However, if it is a team assignment that is late, ALL team members incur a 0.7% penalty each.

Grading Scale:
- A.............100-90
- B.............89-80
- C.............79-70
- D.............69-60
- F.............59-0

GRADING POLICIES:

1. All assignments are due at the beginning of the class period.
2. The final project reports will be written in the IEEE format. Late reports will incur a 50% penalty per week and will not be accepted more than two weeks late.
3. Each student will be required to make two formal oral presentations during the semester. A grade of “F” will be given for the course, if the student or student group does not complete the final project documentation and presentation successfully.
4. Class work will not be submitted to the main Engineering Technology Department office or placed in the instructor’s mailbox.
5. The student is required to attend all scheduled lectures. The student shall be dropped from the course for three (3) unexcused absences in the lecture. An excused absence can only be guaranteed by obtaining, in advance, instructor authorization. A student shall be considered absent if twenty or more minutes late to class.
CLASS POLICIES:

1. All rules relating to academic dishonesty will be enforced in accordance with University policies. Cheating on quizzes, examinations and laboratory assignments, and plagiarism on various papers and reports are types of disciplinary misconduct for which penalties are assessed under the UNT Code of Student Conduct and Discipline. Major responsibility for implementing the University's policy on scholastic dishonesty rests with the faculty. Be advised that the instructor of this course supports and fully implements this policy. The following actions will be taken when evidence of such misconduct is observed. The student will be presented with the evidence of misconduct and given an opportunity to explain same. Based on the outcome of this private conference, the matter will be either dropped or the student will be given a grade of "F" in the course and be referred to the Dean of Students for further counseling and/or disciplinary action.

2. State common law and federal copyright laws protect my lectures. They are my own original expression and I record them at the same time that I deliver them in order to secure protection. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record my lectures, to provide your notes to anyone else or to make any commercial use of them without expressed prior permission from me.

3. During the course, handouts will be provided to enhance the presentation of certain concepts. These materials are provided strictly for instructional purposes and may otherwise be restricted. There is no authorization for further reproduction of distribution of handout materials beyond that intended to teach the course.

4. This syllabus is subject to change at any time during the semester with changes to be announced in class.

5. Students should schedule at least one hour per lecture hour for study outside class. Students should schedule at least one hour per laboratory hour for outside work to prepare for the laboratory, use of open laboratory hours, and to complete the required laboratory documentation.

6. Grades are based, in part, on the student's ability to communicate. Well written English is expected in all course work and is a factor in laboratory report grades. The student’s ability to orally communicate the results of laboratory exercises and class assignments is also monitored.

7. Each student should retain graded lecture notes, pop quizzes, homework, tests, software-generated files, and laboratory reports to document errors in recorded grades.
8. Requests for review of graded work must be submitted during the lecture in which such work is returned to the students. The request should be accompanied by a written justification of the request including any supporting data.

9. The UNT Catalog procedures on cheating and plagiarism will be vigorously enforced. It is the duty of all students to protect their work so it is not available to others for submission as their efforts. This is especially true of files that are generated on the computer. Students who knowingly allow others to use their work are partners in this unethical behavior.

10. There is no limit to the use of calculators for lecture, labs, pop quizzes, formal tests, or final examination.

11. Challenges to the course grade must be presented within 60 days of receipt of grade notices mailed by the university. This will insure that instructor’s records are still available to allow a review of the assigned grade. You should first discuss your complaint with the instructor. If you wish to carry it further, contact the Program Coordinator by calling (940) 565-2022. To further pursue your complaint, contact the Department Chair at (940) 565-2022, but ONLY after first discussing your concern with the previous two individuals.

12. If appropriate, Material Safety Data Sheets (MSDS) are maintained on file in the department for your review. Access to these documents may be provided by the:
   • instructor of this course,
   • Program Coordinator, or
   • Department Secretary.
   Seek initial access through the instructor or Coordinator rather than the secretary.

13. An I (incomplete) grade is given only for extenuating circumstances and in accordance with University and Departmental Policies.