Syllabus
Engineering Technology
University of North Texas
Course Title: Senior Design I
Course Prefix and Course Number: ELET 4780
Semester: Fall 2016

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

ENGINEERING TECHNOLOGY
COLLEGE OF ENGINEERING
UNT RESEARCH PARK
940/565-2022
DATE PREPARED: August 23, 2016
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/electronic 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.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE</th>
<th>DATE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>M 08/29</td>
<td>Engineering (research and development, product support, documentation). Manufacturing and operations. Quality assurance. Finance.</td>
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<tr>
<td>2</td>
<td>—</td>
<td>M 09/05</td>
<td>NO CLASS (Labor Day).</td>
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<tr>
<td>3</td>
<td>2</td>
<td>M 09/12</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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<td>5</td>
<td>4</td>
<td>M 09/26</td>
<td>The six steps: step 1, research and gathering information.</td>
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<tr>
<td>6</td>
<td>—</td>
<td>M 10/03</td>
<td>MIDTERM PRESENTATION</td>
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<tr>
<td>7</td>
<td>5</td>
<td>M 10/10</td>
<td>The six steps: step 2, develop design specifications.</td>
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<tr>
<td>8</td>
<td>6</td>
<td>M 10/17</td>
<td>The six steps: step 3, project scheduling.</td>
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<tr>
<td>9</td>
<td>7</td>
<td>M 10/24</td>
<td>The six steps: step 4, the preliminary design, component selection.</td>
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<td>10</td>
<td>8</td>
<td>M 10/31</td>
<td>The six steps: step 4 cont., prototype development.</td>
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<td>11</td>
<td>9</td>
<td>M 11/07</td>
<td>The six steps: step 5, design verification.</td>
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<tr>
<td>12</td>
<td>10</td>
<td>M 11/14</td>
<td>The six steps: step 6, design improvements.</td>
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<tr>
<td>13</td>
<td>—</td>
<td>M 11/21</td>
<td>FINAL PRESENTATION</td>
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<tr>
<td>14</td>
<td>—</td>
<td>M 11/28</td>
<td>End-of semester project wrap-up. FINAL REPORT DUE.</td>
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</table>

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

All relevant Engineering Technology Software. MS Project and MS Visio.

ORAL COMMUNICATION USAGE:

Each student/group 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>
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<tr>
<td>2. Organization of Topics</td>
<td>0 1 2 3</td>
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<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>
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<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>
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<tr>
<td>8. Effective Demonstration with a working model</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>9. 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>10. Subjective Evaluation</td>
<td>0 1 2 3 4</td>
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</table>

**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 __________ LABORATORY NUMBER _____

LABORATORY 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>
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<tr>
<td>2. Diagrams</td>
<td>10</td>
<td></td>
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<tr>
<td>3. Expected Results</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4. Original Data Sheets</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5. Analysis of Results</td>
<td>10</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>
<tr>
<td>9. Professionalism signature</td>
<td>10</td>
<td></td>
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</tbody>
</table>

Composite Score __________

Professionalism Signature (TA verifies the student preformed the experiment, that the position computer is logged of and position is clean.):

_____________________________________  Date Completed:____________________

EVALUATOR COMMENTS _______________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
GRADING ELEMENTS AND WEIGHTS:

Attendance                                  20%
Weekly reports and adherence to schedules                           20%
Mid-term Presentation     20%
Final Presentation      20%
Final report       20%
Total  100

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

GRADING POLICIES:

1. The student is required to attend all scheduled lectures class times. **The student shall be dropped from the course for three (3) unexcused lecture absences.** 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.

2. The student is required to submit a weekly report via email to elias.kougianos@unt.edu on his/her activities the previous week. The report will be due on Sunday by 5:00PM and will follow the format provided by the instructor. The schedule for the report submission is provided below. Time will be determined by the time indicated in the header of the email. One unexcused late or missed report will incur a penalty of 5% of the total grade. Two unexcused late or missed reports will incur a penalty of 11% of the total grade. In this case the maximum grade earned can only be a “B”. **Three unexcused late or missed weekly reports will result in the student being dropped from the class.**

3. **An unexcused late or missed mid-semester presentation will result in the student being dropped from the class.**

4. An unexcused late or missed final presentation will result in the student receiving a grade of “F”.

5. **Late submission of the final report will result in an 11% grade penalty.**

6. **Failure to submit the final report will result in a class grade of “F”.**
WEEKLY REPORT SUBMISSION SCHEDULE

<table>
<thead>
<tr>
<th>Report</th>
<th>Date/Time Due</th>
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<tbody>
<tr>
<td>1</td>
<td>Sunday Sep. 11th, 5:00PM</td>
</tr>
<tr>
<td>2</td>
<td>Sunday Sep. 18th, 5:00PM</td>
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<tr>
<td>3</td>
<td>Sunday Sep. 25th, 5:00PM</td>
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<tr>
<td>4</td>
<td>Sunday Oct. 2nd, 5:00PM</td>
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<tr>
<td>5</td>
<td>Sunday Oct. 9th, 5:00PM</td>
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<tr>
<td>6</td>
<td>Sunday Oct. 16th, 5:00PM</td>
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<tr>
<td>7</td>
<td>Sunday Oct. 23rd, 5:00PM</td>
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<td>8</td>
<td>Sunday Oct. 30th, 5:00PM</td>
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<td>9</td>
<td>Sunday Nov. 6th, 5:00PM</td>
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<tr>
<td>10</td>
<td>Sunday Nov. 13th, 5:00PM</td>
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<tr>
<td>11</td>
<td>Sunday Nov. 20th, 5:00PM</td>
</tr>
</tbody>
</table>

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 other wise 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.

6. Grades are based, in part, on the student's ability to communicate. Well written English is expected in all course work.

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. 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.

11. 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.

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

13. To comply with FERPA policies, I will communicate via email (email me at elias.kougianos@unt.edu) but I will only respond to UNT email accounts.