Introduction to Engineering-10.02

De Anza College spring 2019

Manizheh Zand

Class hours:
Tue, Thurs
1:30 am -2:45 pm
3:00 pm-:515 pm
Rooms S48

Office hours:
Thursday 11:20 am to 12:30 pm
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> M.A. Rosenoff: "*Mr. Edison, please tell me what lab rules you want me to observe.*"
>
> Thomas Edison: "*There ain't no rules around here. We're trying to accomplish something.*"
>
> A whole New Engineer by David E. Goldberg and Mark Somerville

Course objectives

Introduction to Engineering is designed to allow students to explore engineering through hands-on design projects. Students learn about various aspects of the engineering profession and acquire both technical skills and non-technical skills, in areas such as communication, teamwork, and engineering ethics. Students would learn about human factors as well as design factors within an overall process and including product life cycle stages.

By designing and implementing an actual engineering project, students will be exposed to many ideas and principals. Students will form teams of 2-3 and choose projects which excite them – and importantly, projects that have a good purpose. Successfully completing the project is not required; this provides the opportunity to deeply understand and analyze different technical and non-technical aspects of the project.

The theory is an important part of the projects. The actual goal of the projects is to prove or disprove a theory by gathering supporting data by creating proper tests and analyzing why or why not the expected outcome was achieved.

It is highly recommended to create a diverse team so students would get a good sense of the different engineering fields and how they overlap. Students will understand the importance of teamwork and leadership. They would learn to understand the concept of project management by experiencing the importance of organizational skills and time management skills while keeping track of the budget. They would create PERT and Gantt charts.

Throughout the course, students will be reminded to check for engineering ethics.

Students would be able to have several mini-presentations and draft reports opportunities before submitting their final ones. As a class, students would do peer evaluations by providing constructive feedback.

Course Requirement:
Begin this course with an open mind.

Text

Recommended but not required

ENGINEERING YOUR FUTURE, A Comprehensive Introduction to Engineering By William C. Oakes, Ph.D. 2009-2010 Edition

A Whole New Engineering, The Coming Revolution in Engineering Education by DAVID R. GOLDBERG and Mark SOMERVILLE

Grading Policy

The weights of the course work assignments are listed below:

·	**Project Proposal**	**5%**
·	**Market survey**	**5%**
·	**Pert & Gantt chart**	**5%**
·	**Theory**	**5%**
·	**Part status/order**	**5%**
·	**Draft PPT**	**5%**
·	**Draft Report**	**5%**
·	**Human Report**	**5%**
·	**Final PPT**	**5%**
·	**Final Report**	**5%**
·	**Excel-HW**	**10%**
·	**Written Assignments**[*]	**10%**
·	**Quizzes**	**10%**
·	**Class participation**	**10%**
·	**Arduino workshop**	**10%**

*Written Assignments
  1. Ted Talk
  2. Mentor Interview
  3. Ethics

And the overall course grade (letter-grade) will be assigned based on the distribution below:
- · 100% to 86%: Distributed for A+, A, and A-
- · 85% to 71%: Distributed for B+, B, and B-
- · 70% to 56%: Distributed for C+, C, and C-
- · 55% to 41%: Distributed for D+, D, and D-
- · 40% and below: F

Excel HWs and written assignments must be submitted on time otherwise up to 50% credit will be given

No Makeup quiz will be given

Project reports, PPTs, and the presentation must be on time. No exception!
All team members must be present and participate in the presentation; otherwise, they will lose up to 50% credit.

Please refer to the calendar for the days that each team must be present and work on their projects during class time.

Written Reports
20%   Peer review
10%   Summary/Introduction/Abstract
5%   Market Survey
10%   Theory/Human Factor
20%   Project management such as Pert, Gantt, budget, Parts, task assignment,…
20%   Test/Verification/Result/Setup- technique and interoperations
10%   Conclusion
5%   References/Appendixes

PPT
20%   Peer review
10%   Format
25%   Presentation (team and individual)
5%   Market Survey
10%   Theory
30%   Verifications/Outcome

Please note that the instructor will create a master project folder on Dropbox during the first week of class to create access for each team. Students are required to contentiously upload their work **to** this folder. Students are responsible for checking the calendar folder on a regular basis to see if there is a change in the schedule.

Course outline:

Week	Lecture	Assignments/ Activities
1 April 8th	**Team Building Gantt Chart Pert Chart**	**Introduction Individual Gantt Chart- Due Thursday Individual Pert Chart- Due Thursday Arduino workshop**
2 April 15th	**<u>Written</u> report Proposal Survey Format Excel Engineering Professions**	**Team Creation – Due Tue Gantt Chart-1 and pert Chart-1 – Due Thursday Fusion 360 workshop (TBA) Arduino workshop**
3 April 22nd	**Theory Ethics Excel**	**Purchasing Status Report-1- Due Tue Survey Report (questions) - Due Thur Arduino workshop Excel Quiz -Thur**
4 April 29th		**<u>Proposal –Due Tue</u> Theory- Due Thur Survey Report (analysis) - Due Thur Arduino workshop**
5 May 6th	**Excel**	**Purchasing Status Report-2- Due Tue Gantt Chart-2 Due Tue Pert Chart –2 Due Tue PPT Draft 1 – Due Tue Written report Draft 1 – Due Thur Excel Quiz – Thur Arduino workshop**
6 May 13th	**Testing strategy Excel**	**Draft 1 Team Presentations – <mark>Mentor Interview – Due Thursday</mark> Arduino workshop**
7 May 20th	**Human factor**	**Work on PPT draft 2 Work on Written report draft 2 Gantt Chart-3 Due Tue Pert Chart-3 – Due Tue Human factor PPT- Due Thur Human factor written report – Due Thur Bring your parts and work on your project-entire week <mark>Tedtalk paper– Due Thursday</mark> Excel Quiz- Thur**

		Arduino workshop
8 May 27th	No Class on Monday	**Project Presentation-** **2nd Draft PPT – Due Tue** **2nd Draft written report – Due Tue** **Bring your parts and work on your project-entire week** **Arduino workshop**
9 June 3rd		<mark>**Ethics Paper – Due Thursday**</mark> **Bring your parts and work on your project-entire week** **Arduino workshop**
10 June 10th	**Product Life Cycle**	**Bring your parts and work on your project-entire week** **Arduino workshop**
11 June 17th		**Final Presentation PPT and written report**
12 June 23rd		**No class, No exam**

<u>Student Learning Outcome(s):</u>

*The student will be able to analyze, graph and develop a formula for a given data set.

*The student will be able to prepare and write technical specifications and documentation, and be able to orally present them.

*The student will work collaboratively on an engineering team.