

## **Introduction to Engineering - 10.01 & 10.02**

De Anza College winter 2019

**Dr. Salman Ahsan**

### **Office S48**

**Office hours (Tentative):** MW 9:00 to 9:30 AM, TR 11:20 – 11:50 AM

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### **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 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, 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 are meaningful and impactful. Successfully completing the project is not required; rather the emphasis is on demonstrating a deep understanding and to analyze different technical and non-technical aspects of the project.

The theory is an important part of the project. One 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 team work 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 be bounded by ethical principles.

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

### **Course Requirement:**

Begin this course with an open mind, an inquisitive spirit and a willingness to learn to be organized and methodical.

### **Text**

(Recommended but not required)

*Engineering your Future: A Comprehensive Introduction to Engineering* by William C. Oakes and Les Leones. 9<sup>th</sup> Edition

*A Whole New Engineer: The Coming Revolution in Engineering Education* by David R. Goldberg and Mark Somerville

## Deliverables

You must submit the following in order to complete the course

1. Written Assignments (individual)
  - a. Engineer interview
  - b. Ethics paper
  - c. Teamwork paper
  - d. TED talk review paper
  - e. Peer evaluation
2. Team Assignments
  - a. Project proposal
  - b. Draft report
  - c. Draft PPT
  - d. Final report
  - e. Final PPT and demo

## Grading Policy

To determine your final grade the deliverables will be weighted as follows:

- Project Proposal           20%
  - Market survey
  - PERT & Gantt chart
  - Theory
  - Part status/order
  - References and/or appendices
- Draft PPT                   5%
- Draft Report               5%
- Final PPT and demo       20%
- Final Report               10%
- Written Assignments\*   25%
- Class participation\*      10%
- Pop quizzes               5%

\* These will be scored individually.

The class participation part of the grade implies that attendance is mandatory. Ensure that vacations, doctor's appointments, social engagements, etc. do not interfere with attendance. Active class participation, including the completion of all class exercises, is key to achieving educational success. Class activities cannot be made up if the class is missed. If you are absent from class, the onus of checking on announcements made while you were absent is on YOU.

**For full credit consideration, all materials must be submitted on time. Work submitted even a minute late, but within 24 hours of the due date, will be docked 50% points. Work submitted past 24 hours will earn a zero but will still need to be submitted for successful completion of the course.**

**No makeup quizzes will be conducted.**

**All team members must be present and participate in the final presentation; otherwise, the team will be docked up to 50% of the credit, unless an exception has been granted by the instructor ahead of time.**

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

### **Classroom Protocol**

Please arrive to class on time. If you do happen to arrive to class late, please enter and take your seat quietly. Expected classroom courtesies include: no text messaging, no emailing, no checking emails, or no gaming. Likewise, no recording of lecture, no in-class picture taking of lecture slides, no making/receiving phone calls. No copying or sharing of instructional material, including videos, PowerPoint slides, notes, handouts, problems, solutions, quizzes, tests, simulations, etc.

Note that any inappropriate or disruptive behaviors, including offensive/vulgar expressions, disrespecting others' viewpoints or disrespecting the instructor could lead to removal from the classroom and/or disciplinary action, as warranted.

### **Communication**

Email communication is most appropriate for administrative matters (notification of illness, scheduling appointments, clarification of homework problems, etc.). Homework problems or other course materials are best discussed in person during scheduled office hours and not by email.

Please note that the instructor will create a master project folder on Dropbox 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.

<b>Tentative Course outline: Week</b>	<b>Activities</b>	<b>Assignments (see calendar for exact due dates)</b>
1	Introduction Team Building- Lecture Gantt Chart- Lecture PERT Chart- Lecture	
2	Market research - lecture Survey Format- lecture	- Form teams. Submit teams to instructor for final approval  - Teamwork paper
3	Arduino – lecture Arduino - demo	Project proposal
4	Theory- Lecture Ethics- Lecture	Purchasing status report
5	The human factor and data visualization – TED Talks	Ethics paper
6	Engineering Professions lecture	TED Talk reflections paper
7	Testing strategy- Lecture	Engineer interview
8	The obsession with precision and the march to tighter tolerances	Draft project PPT and written report
9	Engineering Professions - lecture	
10	Product Life Cycle-lecture	
11		Demo, final Presentation PPT and written report Peer evaluations

**Student Learning Outcome(s):**

\*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.