Introduction to Engineering
Engr 10
De Anza College Winter 2016

Section 2
Dr. Lee Aarons, PhD
9:30am-11:20am
Monday-Thursday in S44

Office hours (S43): Wednesday & Thursday 11:30 am to 12:30 pm
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Syllabus:

The goal of this course is to introduce students to the many facets of engineering, so that students gain appreciation of engineering in its various forms and learn good engineering practices. Students will learn the core concepts and practical uses of the major fields of engineering and will acquire skills every engineer should possess, including researching, estimation and approximation, technical writing and presenting, teamwork, planning, and engineering analysis. Students will also be made aware the topics of engineering ethics and the intersection of engineering and politics.

Aside from the final project, which is described below, assignments will take the form of group projects. Groups will be assigned topics to research and then will present their findings to the rest of the class. At this time, two large projects (in which students are expected to take two to three weeks to complete) and one small project (in which students are expected to take less than a week to complete) are planned.

Classes are divided into lectures (MTW 9:30-10:20 am) and labs (MTW 10:30-11:20 am and Thurs. 9:30-11:20 am). During lab time, students will participate in a variety of activities, including but not limited to work on in-class projects or the aforementioned assignments, research, “lively discussions” of a variety of engineering topics (such as engineering in media and pop culture or weighing risk and reward), or hosting a guest speaker.

Following are the tentative grading breakdown, description of the final project, and a list of possible topics that may be discussed in this class. Due to the broad scope of this course, there likely will not be sufficient time to cover all of these topics, and so students are encouraged to request topics to be covered during the term, regardless if they are listed below.

Grading breakdown:

35% Final project report and presentation
20% Proposal for final project

40% Other projects and homework
5% Class participation

Final project:

For the final project, students have the choice of working alone or in groups of 2 or 3 (though students are strongly recommended to work in groups). Students may work on any project a professional engineer may. This includes, but is not limited to, (1) constructing or repurposing a piece (or multiple pieces) of useful technology, (2) creating a useful computer program or phone app, (3) performing extensive research on an engineering topic, or (4) performing or reproducing an experiment. Students are expected to perform somewhat thorough research prior to starting their final projects. The students will present this research and their work plans in the form of a written proposal. After completing their projects, students will submit a written report and give a presentation. Success of the project will be judged on the research and project plans discussed in the proposal, and the analysis given in the report and presentation, not on whether the intended goals of the project were achieved. If the group chooses to construct machinery or code, it does not need to work. If the group performs an experiment, the intended goals of the research do not need to be reached.

Presentations will be given during the final exam period and, if needed, the final week of regularly scheduled classes. The exact dates depend on the total number of presentations. The final written report will be due the last class day before the day of the first presentation. The proposal will be due roughly one month before the final class. Students must email me their ideas for their projects, along with the names of the members of their groups, at any time before submitting a proposal.

Topics to be covered (in no particular order):

Estimation and Simplification Techniques
Researching
Error checking
Cost Analysis
Data Analysis
Risk Analysis
Time Management
Writing and Presenting
Newton’s Laws of Motion
Thermodynamics
Numerical Analysis and Simulation Techniques
Chemical Engineering
Mechanical Engineering
Civil Engineering
Computer Science

Computer and Electrical Engineering
Biomedical Engineering
Engineering Ethics
Politics in Engineering