MWF 12:30-1:40
Meeting Location: Class: PBSci305/BE287
Instructor: Mark Akeson (makeson@soe.ucsc.edu)
Office: PBSci 408; Office Hours: 2-4pm, W, appointments highly recommended
Tel: 831-459-1038(office)

Description
This is the first of a two-course sequence serving as the design capstone of the engineering departments. It is a challenging and fitting opportunity for students to use their skills and knowledge obtained as an undergraduate engineering student in a practical, systems level engineering project. A major aim of this course is to foster interdisciplinary teamwork and thus it is a requirement that students work in groups, the goal being that students will come to realize the productive potential of a team of motivated engineers with complementary skills.

The class will be modeled after a startup company, with the instructor’s roles similar to that of VPs of engineering. Each group will be treated as a design team with an elected team leader and possibly a deputy leader. Students will learn about effective teamwork, mutual responsibility and project management. Experience with the entire cycle of engineering design will be discussed, from concept, specification, experimental prototyping and verification, up to the final design and implementation. Unlike 123A courses in CE and EE, students in BME 123A must rapidly progress into project design implementation because the experiments can be complex and sometimes fairly expensive.

Besides technical competence, presentation and written skills are vitally important to your success as future engineers. Consequently, this first course considers the social context of professional engineering teamwork. Presentation techniques will be covered in class and a number of oral group talks are required during both 123A & B. At the end of the quarter, each team will give a collective presentation of their project and submit a formal report including technical specifications of their project and discussion of their experiences over the quarter. An engineering notebook is also required; more information on the topic will be discussed in class.

Class meetings will be an open forum for lecture, discussion, problem resolution, and group dialogs. Often class time will be devoted to meetings of a given group with the instructor. We will expect every member of a team to have a sound understanding of the entire project and to have thorough knowledge of their portion of the design. You may be asked to present findings or briefly lecture on topics for which you have become an expert or especially informed.

Presentations by your instructors, faculty and other guest speakers will suggest possible projects. Students are encouraged to ask faculty members for project ideas and for support, and to propose a project they have conceived. There is a caveat: projects conceived by any student must have a precisely defined objective that can be achieved in two terms.
Evaluation
Your performance evaluation in this class will be based on the following general areas:
1. Ability to apply the fundamentals of design to a particular project while working as part of a group, including:
   a. Exercising judgment and independence in creating a project with clearly defined specifications and achievable goals
   b. Creating a realistic schedule with target milestones
   c. Demonstrating competence in describing your project goals and specifications
   d. Doing independent research to determine viable components, showing the ability to comprehend data sheets and application notes
   e. Participating in peer group design reviews of each person’s work
2. Demonstrating independence and self-motivation in mastering new topics necessary to successfully complete a project
3. Presenting course and project material to the class. This includes the quality of the slides, professionalism of the presentation and creativity of the delivery/slides
4. Demonstrating technical competence in related hands-on experimental laboratory work
5. Formal group final presentation and written report with technical specification of project
6. Attendance in class and completion of assignments and readings
7. Quality and detail of laboratory notebook
8. Ability to work effectively as a team. Your teammates evaluation of you will have a significant effect on your letter grade

Letter grades will be assigned for all assigned work. Final grades are arrived at by summing weighted grade points and converting back to a letter grade as follows:
1. Written assignments (including notebooks) and laboratory competence constitute 25% of the grade.
2. Presentations constitute 75% of the grade, with this grade divided equally among two group presentations and the final team report. Each of the three presentations will be graded in four general areas:
   • Individual delivery 20%, personal grade
   • Individual contribution to the project 20%, personal grade
   • Quality of slides 10%, group grade
   • Quality of content 25%, group grade
   • Group presentation 25%, group grade

Laboratory
To accomplish the task of coming up with a project, evaluating its feasibility, and designing and prototyping it students are being given the privilege of unsupervised lab access (principally room 287 BE). Any abuse of equipment or misuse of resources will result in the immediate loss of these privileges, and may result in disciplinary action by the University. The University rules regarding academic integrity will be enforced in all aspects of this course. It is expected that you will keep the lab pristine and orderly and respect other group’s equipment and space. The lab
space is reserved for student enrolled in the class and for other classes. It is not a place for your
friends to hang out. Please report any misuse immediately to the instructors.

Laboratory notebook: In keeping with standard industrial practice, students will be required to
create a suitable engineering notebook (see separate handout for details). A nice lab notebook is
available from: http://www.bookfactory.com/lab010.html. Staples and Office Max also have
good laboratory notebooks.

**Academic Integrity**
Anyone caught cheating in the class will be reported to their college provost (see UCSC policy
on academic integrity) and may fail the class. Cheating includes any attempt to claim someone
else's work as your own. Plagiarism in any form (including close paraphrasing) will be
considered cheating. Use of any source without proper citation will be considered cheating. If
you are not certain about citation standards, please ask, as I hate having to fail students because
they were improperly taught how to cite sources. Collaboration without explicit written
acknowledgment will be considered cheating. Collaboration on lab assignments with explicit
written acknowledgment is encouraged—guidelines for the extent of reasonable collaboration
will be given in class.

**Classroom Accommodations for Disabilities**
If you qualify for classroom accommodations because of a disability, please submit your
Accommodation Authorization from the Disability Resource Center (DRC) to the instructors
during my office hours in a timely manner, preferably within the first two weeks of the quarter.
Contact DRC at 459-2089 (voice), 459-4806 (TTY).