CE/EE-123A: Computer and Electrical Engineering System Design I
(CE students must register for CE123A & EE students in EE123A)

Fall 2006

Meeting Times:  TuTh 4:00pm – 5:45pm
Meeting Location:  Class:  BE165
Laboratory:  BE-111

Instructors:
Cyrus Bazeghi (<cyrus@soe.ucsc.edu>)
Office:  E2 319
Office Hours: TuTh 2:30pm – 4:00pm, and by appointment
Tel: 459-2217 (office), 566-0960 (cell)

Wentai Liu (<wentai@soe.ucsc.edu>)
Office:  E2 341A
Office Hours: Wednesday & Thursday 11:00am – 12:00pm, and by appointment
Tel: 459-1721 (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 incredible potential of a team of motivated engineers with complementary skills. The class will be modeled after a startup company, with the instructors serving as the VPs of engineering. Each group will be treated as a design team with a team leader and possibly a deputy leader. Students will learn about effective teamwork, mutual responsibility and project management. Experience will be gained from the entire cycle of engineering design from the concept, the specification, experimental prototyping and verification, up to the final design and implementation (the last two begin in 123A and are completed in 123B).

It is required that students become proficient in oral presentations. Hence, presentation techniques and ‘hints to the wise’ will be covered in class and a number of presentations will be required of students during both 123A & B. Each team will give a collective oral presentation of their project at the end of this course and submit a formal report including a technical specification and discussion of their experiences over the quarter. Information such as schedule delays and changes, to failures and challenges should be covered. A daily journal in a lab book is also required; it should contain what you worked on and any insights you have learned. More information on the lab notebook requirements will be discussed in class.

The class meetings will be an open forum for lecture, discussion, problem resolution, and group one-on-ones. We will expect every member of a team to have a general 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 will suggest possible projects. Students are encouraged to ask faculty members for project ideas and for support. Students are also encouraged to contact other departments for true interdisciplinary projects ideas.

Textbook:
Evaluation:
Your performance in this class will be based on the following general areas:

1. Ability to apply the fundamentals of system 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. Doing independent research to determine viable components, showing the ability to comprehend data sheets and application notes.
   d. 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 project, including new EDA and CAD tools.

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. This would include competence using all applicable laboratory equipment such as oscilloscopes, spectrum analyzers, RF network analyzers, DVM, waveform generators, etc.

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 the most affect on you letter 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 unlimited and unsupervised lab access. This includes the use of laboratory equipment (computers, printers, scopes, etc) and resources (web-access, email, ftp, etc) in a responsible and respectful manner. 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. Lab support will be provided by the Baskin Engineering Lab Support Group (bels@soe.ucsc.edu). Please report immediately any problems pertaining to the laboratory to them, they are also an excellent resource for parts. It is expected that you will keep the lab clean and orderly and respect other group’s equipment and space. The lab space is reserved for student enrolled in the class only. It is not a place for your friends to hang out. Please report any misuse immediately to the instructors.

BELS will install any special software or hardware that you acquire and need. The instructors will also have root access on the computers and can install any required software needed in an emergency. In some cases students can be give local root access to the machines.

Laboratory notebook:
In keeping with industry practices students will be required to purchase a bound engineering notebook. You will be required to keep a daily log of all activities related to your project. Details of proper lab notebook usage will be covered in class. You will also need a large 3-ring, loose-leaf binder to organize and protect hardcopy material, such as data sheets /specifications and printouts of material pertinent to your project.

A nice lab notebook is available from: http://www.bookfactory.com/lab010.html. Staples and Office Max also have good laboratory notebooks. The UCSC bookstore may have some also.