

CpE/EE391 – Senior Design Project I

Fall Semester, 2001

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Office hours (tentative): Tue, Thr 1:30–2:30 PM

(Though I'm often available at other times)

Prerequisites: Stat217, CpE111, Econ 121 or 122, Sp&M 85, Eng 160, CpE213, CpE214,
Comp. Org. Elective

Textbook: G. Volland, *Engineering by Design*, Addison Wesley, 1999

Recommended supplements:

- *Engineering Design for Electrical Engineers*, A. Wilcox, Prentice Hall, 1990
- Other information soon to be available at:
<http://www.umn.edu/~daryl/classes/classes.html>.

Grading: (*Tentative*)

25%	Project proposal
20%	Project presentation
10%	Project poster
25%	Project organization and progress
15%	Homework and quizzes
5%	Evaluation - team work and class participation (I can push your grade up or down by 2.5%)

Grades will be curved, if appropriate.

Course objectives:

- Begin development of a product by forming project teams, locating a customer and project advisor, developing a product development plan, presenting your plan in written and oral form, and beginning some product design.
- Become familiar with important concepts related to developing a product in a competitive business environment. Topics include: proposal development, project management, quality assurance, safety considerations, design creativity, ethics and standards, effective presentations, product testing and evaluation.

Course Schedule:

- 8/20 Course overview. Intro to Engineering Design (Ch 1.1-1.4)
- 8/27 Defining your project - Needs assessment (Ch 2)
- 9/3 Labor Day.
- 9/10 The search for a problem and solution (Ch 3 + 4)
Rough project outline due.
- 9/17 Intellectual property (Ch 5)
- 9/24 Coming up with the design - creative thinking (Ch 7)
- 10/1 Writing your proposal (Ch 1.5)
- 10/8 Ethics and societal impact (Ch 8)
- 10/15 Project management
- 10/22 Economic considerations (Ch 10.8)
Project proposal due
- 10/29 TBA
- 11/5 Improving your proposal
- 11/12 Effective presentations
- 11/19 Team Presentation/Design Review
- 11/26 Team Presentation/Design Review
- 12/03 Team Presentation/Design Review

Quizzes:

We will *probably* have a quiz or 3 in class over material covered in the lecture and in the homework. Quizzes should be relatively short – 15-30 minutes long.

Homework:

- You are expected to read appropriate sections of the textbook before presentation in class
- Homework problems will be assigned in class
- As a rule of thumb, no late homework is accepted.
- While you are expected to complete all assigned problems, the grader may randomly pick only certain problems to grade. It is common in larger classes to compute your grade based on the accuracy of 1 or 2 problems and an evaluation of how hard you “tried” on the rest.
- I strongly encourage you to study with others, as this can be a powerful tool for learning. However, I insist that you must a) attempt to understand and solve each problem by yourself and b) thoroughly understand any solution you turn in. If you

cannot adequately explain the basis for your solution at a later date, no credit will be given for that homework even if your solution is correct. Simply “copying” someone else’s homework will be considered cheating and will not be accepted under any circumstances.

Attendance:

Attendance to lectures is not required though strongly recommended. However, I will not be sympathetic to problems caused by skipping class without a documented excuse. Excessive absence (in particular, failure to attend a quiz or exam without an excuse) may cause you to be dropped from the course.

Attendance to team presentations is mandatory and is part of your homework grade.

Cheating:

Don’t do it. Department policy is to fail you in the course on the first offense and to expel you from school on the second.

Team Organization and Progress:

This grade will be based in part on your on my observations and on comments or an evaluation from your technical advisor, team members, customer, and class mates. Teams will evaluate their own progress in the proposal and presentation and also in two short progress reports during the semester. Teams will also be given the opportunity to evaluate the contribution of each member, both as a team and individually, through a confidential, in-class evaluation toward the end of the semester.

Project Selection:

Select a project that is interesting to you. Understand, though, that you particular part of the project may involve work outside your preferred area and this is the nature of real engineering. Make use of this opportunity to broaden your knowledge and experience. Do not choose a project that is too big. Your goal is to complete your project and deliver something that works! Projects will be available from faculty and outside companies. You may also formulate your own project, but all projects must have a faculty technical advisor and must be approved by me.

Team Size:

The size of the group should match the size of the project, with enough “action” for everyone. Normally, groups consist of three or four people. Groups of one or groups of more than 5 members are rare and will require special permission from me. If your group seems large for your project I may ask you to reduce your size or to increase the level of effort. In general, I will expect more from a large group than a small group.

You will pick your own design teams. Be careful whom you choose to work with – you will be with them for two semesters and your grade will depend largely on the ability of your team. On rare occasions, I may ask you to take additional members or to give one of your team members to another team. That’s the real world.

Advisor:

Each design group MUST have at least one technical advisor. In some cases, the advisor may be the same person who is the customer. The design group is responsible for the progress and success of their project. The technical advisor is only a helpful consultant who has agreed to make suggestions if you run into a snag. It is your responsibility to find this advisor. In general, I prefer not to be an advisor to teams in my own class.

Funding:

Money for parts and components will generally be supplied by the customer, if funds are available. If funds are not available, the ECE department will furnish 50to100 per student for such components – however, the final product is then technically the property of the department. If you want to build something to take with you, you will need to obtain the parts or components you need.

Hopefully, you will begin ordering some of your components this semester. The procedure for ordering parts will vary. Come see me when you are ready for details.

Laboratory Facilities:

Laboratory facilities are provided for you in EECH 213, the senior design lab. You will also have access to a limited number of other tools and supplies. If you need specialized equipment located in another area, arrangements can be made to use that equipment.

Basic rules for EECH 213:

- Heavy fabrication (like drilling, sawing, machining, and the like) should not be performed in this lab. If you have work of this nature that needs to be done, our technicians can help you in their workshop.
- You are expected to leave the lab clean when leaving. Projects should not be left in place except for extra-ordinary circumstances.
- Equipment should never be removed from the lab (or removed from other rooms and brought to EECH 213) unless special permission is obtained from the department.

CpE/EE 392:

Register of the same instructor for CpE/EE 392 as you had in CpE/EE 391. You will most likely do the majority of your actual design work in this class. There will be mic-course design reviews, a final product demonstration/presentation, a final report, and a poster outlining your product.