

MAE 4287 - Senior Synthesis and Design I - Fall 2009

Fri 1:00 pm to 2:50 pm - Room 311 WH

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Goals

This course is the capstone “design” course in the Mechanical Engineering curriculum. The intent of this course is to allow students to work on a real-world problem from concept to completion and to experience the dynamics of working in a group and on a schedule. The project needs to be broad enough to encompass multi-disciplinary aspects and open-ended such that it does not have a unique solution and could be repeated periodically. “Design” is not intended to be restricted to pure mechanical or kinematic aspects but could focus on thermal, fluid, dynamic systems and controls, materials, or power disciplines. Students will be divided into teams with each student responsible for some aspect of the project. Several projects will be made available to the students. Each student will demonstrate competence in computer use including word processing, spreadsheet manipulation, e-mail communication, internet access, and computer library research.

Class Meeting Schedule (updated 28 Aug)

28 Aug		Organizational meeting
4 Sep		Contracts and proposal writing seminar
11 Sep		Project selection presentations to class. Proposals due
18 Sep	A	Machine Practices (McNamara)
25 Sep	B	Project management, organization, creativity.
2 Oct	A	“Good Design”, design integration, design for manufacturing & cost, simplicity
9 Oct	B	Engineering materials selector (Ratan)
16 Oct	A	Concurrent engineering
23 Oct	B	Mid-semester project review
30 Oct	A	no class
6 Nov	B	Report writing seminar
13 Nov	A	Oral presentations seminar
20 Nov	B	Taped presentation rehearsals
27 Nov		Thanksgiving holiday (no class)
4 Dec		Oral presentations of Projects, Final written reports due

Grading Policy

Final grades will be given to an individual student. The final grade will reflect a single grade for group activity such as the final report. A student’s grade will be based on the following:

▪ Class attendance	15%
▪ Proposal	10%
▪ Mid-semester review (oral and written)	5%
▪ Faculty Sponsor evaluation	15%
▪ Project Monitor evaluation	5%
▪ Instructor evaluation of oral presentation	10%
▪ Home work	10%
▪ Final written report	<u>30%</u>
	100%

Key Assignments

The following key assignments must be completed in order to get a grade for this course: proposal, mid-semester project review, oral presentation by each individual student, and the final report.

Meeting with Faculty Sponsor

Teams are required to meet with their faculty sponsor every week. These meeting will be about 30 minutes in duration and will cover the technical aspects of the project. The team lead will prepare a written agenda for the meeting that covers what was accomplished in the previous week, what are the current challenges, and what is scheduled for the following week. The faculty will assist in solving problems, give technical guidance on challenges, make more resources available, and help guide the project. All team members must be present for these meetings. The faculty sponsor will use these meetings as the basis for the grade he will assign to each individual student. This grade will be based upon how well the student met his obligations by the specified deadlines, the quality of his work, the willingness and cooperative spirit of the student, and whether the student carried his portion of the work load.

Meetings with the Project Monitor

The team will meet with the graduate student assigned as the project monitor on a bi-weekly basis to give status reports. In order to facilitate these meetings, weeks in the schedule have been designated with an *A* and a *B*. Half of the projects will be *A* and half will be *B* and will meet with the project monitor according to the schedule. The reports are limited to organizational and schedule matters and will not review the technical aspects of the project. At each meeting, the team members will discuss what they accomplished in the previous period, their current challenges, and what they will accomplish by the next meeting. The project monitor will evaluate and grade each student for their progress and will report a summary grade to the instructor at the end of the semester.

Costs for the Course

In a normal course, students spend upwards of \$100 for books and supplies. In order to avoid numerous petty cash reimbursements by the administrative staff of the department, each student is expected to bear the cost of incidental materials, parts, and supplies up to \$50. The department will reimburse costs for significant items that will remain with the project. These reimbursable items must be approved in advance by the instructor.

Project Room

Room 212 of Woolf Hall is being used as a project room. You may have your weekly team meetings here. The project monitor meetings will be held here. If the faculty elects, he may use this room for the technical meetings as well. The room has four computers for your use. Please do not use these computers to sign on to Woolfnet (that should be done in the CAD lab). Do not use the computers for personal use, load personal software onto them, or surf the web for personal amusement. Please turn each computer off when through. There are several ongoing projects set up in the room. Please do not touch anything that is not related to your project.

Lecture Summary

Each student will write a summary of the significant lectures or seminars. The summary should be one page single spaced with no cover page. This will serve as homework.

Teams

Each project will have a team of students. Teams will range from 3 to 5 students. The team will select a team leader by the third week. The team leader will be responsible for calling and leading team meetings, assigning tasks to each member, checking on the progress of each member, and interfacing with the faculty sponsor and project monitor.