

ME349

Engineering Design Projects

Instructor:

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Course Objectives:

Students must learn and understand the overall design process including techniques, methods and procedures that add structure and organization to the design process.

Students must have the opportunity to apply this process to a real mechanical engineering design problem. This will involve the conceptualization and design of a project involving brainstorming, problem solving, design development and detailed analytical support.

Students will learn a structured process for design and to apply this design process to a project having commercial applications. In the course of doing this we will learn new things (about engineering, about working together in teams, about ourselves), and hopefully, have fun.

Background:

This class will be different than your other engineering courses since it is designed to simulate real-world design projects. These are team-based projects dedicated to solving a structured design problem.

Because of the team structure, the project solution is not completely within your individual control. It is an atmosphere where the outcome is based upon the results of others and, by and large, you will either succeed or fail as a team.

This course can be a source of frustration to some. You will quickly find that there is no single correct answer or approach and no specific “plan” for success. It is an atmosphere where your instructor or “the back of the book” can’t tell you the ‘right’ answer.

In the end, we hope that we can be proud of our efforts when we’re finished.

Attendance:

On-time* attendance is expected at all classes unless some prior arrangements have been made. This can affect your grade... * and your bank account (r.e. "Late Fees")

Grading:

Grading will be based largely on the quality and execution of the design project as demonstrated through ongoing reviews and the final project. In many (but not all) cases, all members of a design team will receive identical grades. Other factors that may influence grades include a peer assessment by your fellow team members, your design notebook, and observed level of effort. The following is an *approximate* breakdown of how I will determine grades. (insert instructor disclaimer here)

Final design and report (incl. presentation, prototype)	500	pts.
Preliminary design report	150	pts.
Notebook evaluation	100	pts.
My input (from task reports, design update meetings, etc.)	150	pts.
Peer evaluation		Priceless
	Total	~ 1000 pts.

Text: Ullman, David G. *The Mechanical Design Process*

I recommended this text, but it is not required for the course. I will be providing materials on the course web page, some of which are taken from this text. I do think it is a good reference.

Design Notebook:

Each student will be required to keep a design notebook, to be used to record the progress of your project throughout the semester. The National #43-648 Composition Notebook is a good choice.

Project Binder:

Your project team may wish to maintain a project binder for the project. This will be used for collecting the various "loose" materials such as Gantt charts, brochures, and other product information that will accumulate during the design process. I recommend the large 3-ring variety.

Deliverables:

Project teams will be responsible for a [project proposal](#), a [preliminary design report](#), periodic project review documentation, a [final report](#) and a final presentation. The team is responsible for submitting weekly task reports and maintaining an up-to-date project

timeline in the form of a [Gantt Chart](#). The team will also have to complete some level of design prototype. The characteristics of the prototype will be determined on a per-case basis.

At the conclusion of the project teams will need to turn in complete documentation for the design including the design report, the project binder and all required engineering drawings.

Each student will be responsible to develop, maintain and submit his or her [Design Notebook](#) for review at the completion of the project.

Final details are available though the course web page.

The Role of the Instructor

I look at the role of the instructor in a design course as being similar to that of an engineering manager. I will be available to provide advice and to point you in the right direction. I will also provide periodic project assessment. However, I will not be providing you with solutions; I cannot and will not complete your design for you.

I will try to teach you a process by which you may approach the task of solving a design problem. I will also discuss related aspects of product development such as prototyping, product liability, etc.

Some Final Comments and Advice:

Your best strategy is to 'front load' your efforts. That is, do the work early. Often in open-ended courses (and projects) such as this, it is easy to procrastinate. Do not fall prey that! I understand that most of you have other commitments (other course, interviewing, etc.). The existence of simultaneous multiple projects and priorities are very common in industry as well.

So start early, plan and organize the project, trust your teammates and finally communicate.