



University of California, Santa Barbara  
College of Engineering

**Mechanical Engineering**

ME 189 A,B,C      Capstone Mechanical Engineering Design Project  
Fall, Winter, and Spring Quarters 2007-08

Lecturer: Steve Laguette  
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CLASS:      Mondays 5:30 to 6:20 pm  
CLASSROOM: LSB 1001

TA :    Greg Toland  
      Kurt Van Nugtren  
      Eric Dewolf

Mon & Wed from 2 to 3pm, Machine Shop  
Mon 6:30 to 7:30pm Engr II, Rm 2133  
Tues from 2 to 3pm, Engr II, rm 2133

**Course Description**

Students work in teams under the direction of a faculty advisor to tackle an engineering design project. Engineering communication, such as reports and oral presentations are covered. Course emphasizes practical, hands-on experience, and integrates analytical and design skills acquired in the companion ME 156 courses.

**Course Prerequisite**

ME 153 and ME 156 (may be taken concurrently)

**Text, Reference**

Shigley, Joseph E, C.R. Mischke and R.G. Budynas, Mechanical Engineering Design, Seventh Edition, McGraw-Hill, 2004

**Course Objectives**

The course objectives are (1) design problem solving, creative thinking, project planning and teamwork through a challenging design and build project; (2) to provide experience in fundamental engineering reporting and communication including project plans, design reviews, and project reports

**Topics Covered**

1. Formation of Teams
2. Development of a Project Plan

3. Design Research
4. Development of Concepts and Designs
5. Design Development
6. Prototyping
7. Design Analyses
8. Testing and Evaluation
9. Final Design
10. Engineering reporting including presentations, design reviews, and technical reports

### **Credit units of class/laboratory schedule**

2 units each quarter of design efforts with approximately 4 to 6 hours of lecture per quarter

### **Course Assignments**

#### **Fall Quarter Activities (189A) (33% of Final Grade)**

Project selection, Formation of Teams

Design Research

Development of Concepts and Designs

Start Project Binder (3% of Final Grade)

Development of Project Plan (5% of Final Grade)

Development of Product Design Specifications (5% of Final Grade)

Project Prototyping and Testing (5% of Final Grade)

Project Presentation (15% of Final Grade)

#### **Winter Quarter Activities (189B) (33% of Final Grade)**

Design Development activities

Project Planning activities

Prototyping

Design Analyses

Testing and Evaluation

Project Binder (3% of Final Grade)

Preliminary Design Review (10% of Final Grade)

Project Prototyping and Testing (5% of Final Grade)

Engineering Project Report (15% of Final Grade)

#### **Spring Quarter Activities (189C) (34% of Final Grade)**

Design Development Activities

Project Planning activities

Prototyping

Final Design

Testing and Evaluation

Complete Project Binder (4% of Final Grade)

Completion of Design Project (15% of Final Grade)

Final Report /Poster (15% of Final Grade)

### **Professional Component**

2 units each quarter of engineering topic

### **Program Outcomes**

The student should acquire the experience of working as part of a team to solve a challenging and practical design and build problem within a limited budget.

The student and project design team activities will extend from Fall, Winter, and Spring Quarters

The senior design project provides a broad application of engineering skills developed by the curriculum

### **Relationship to Program Objectives**

1. The student gains experience in applying principles of mathematics, science and engineering to solve problems.
2. The student is required to demonstrate the ability to understand and design a useful product in the context of solving a design problem.
3. The student is required to work effectively as part of a team.
4. The student is required to effectively communicate a design

**Prepared by: Stephen W. Laguette**

**Date: October 16, 2007**

## Course Schedule and Assignments

<u>Day/Date</u>	<u>Topic/Activity</u>	<u>Task to be completed</u>
Week 1		
M 10/1	Introduction/Project List	Review Project List
Week 2		
M 10/8	Course Objectives	Form Teams Sign-up Forms due by 10/8
Week 3		
M 10/15	Project Planning	Review template Projects/teams defined
Week 4		
M 10/22	(No lecture scheduled)	Finalize Proj and Teams
Week 5		
M 10/29	Project Presentations	
Week 6		
M 11/5	(No lecture scheduled)	<b>Sat 11/10 Cooper Lab FEA Modeling</b>
Week 7		
M 11/12	(No lecture scheduled)	<b>Prelim Proj Plan Due 11/16 By 5pm Prelim PDS Due 11/16 By 5pm</b>
Week 8		
T 11/19	(No lecture scheduled)	
Week 9		
T 11/26	(No lecture scheduled)	
Week 10		
M-F 12/3 to 12/7	<b>Project Presentations Wed 12/5, Thurs 12/6 ESB 2001 3 to 9pm</b>	<b>Project Binders Due 12/7 Revised Plans/PDS Due 12/7 By 5pm</b>