ME 195A Senior Design Projects  
Fall 2011

**Prerequisites:** ME 114, ME 154 and ENGR 100W (with grade C- or better in each)

**Co-requisite:** ME 120 with good academic standing in the program and an approved major form

**NOTE:** ME 195A&B sequence must be completed in the same academic year

Credit Units: 3 units, 9 hours laboratory

Class hours: Wednesdays, 1:30 – 4:15 PM (but expect to commit at least 10 hrs/week to your project!)

Instructors/Meeting Room:  
Section 1 (40730): Prof. Tai-Ran Hsu, Room E117  
Section 2 (40731): Prof. Nicole Okamoto, Room E114  
Section 3 (40732): Prof. Raghu Agarwal, Room E135  
Section 4 (41432): Prof. Winncy Du, Room E192

Course coordinator: Professor Tai-Ran Hsu (E-mail: tai-ran.hsu@sjsu.edu)

Office hours: Check with instructors

**COURSE DESCRIPTION:**
First half of a one-year team project carried out under faculty supervisions. Project will proceed from problem definition to analysis, design and validation, experimentation including possible construction and testing.


**Grading (overall):** A letter grade will be assigned to each student by the section instructor at the end of the semester and will be based on evaluation of the following course requirements:

- (25%) Delivery of at least three presentations on achievements and timely progress
- (15%) Class and seminar/guest speaker attendance, quizzes, and assignments
- (45%) End-of-semester report and accomplishments
- (15%) Individual performance evaluation

**Work Area:**
- Do NOT leave trash in the area. Hazardous materials are to be kept in safe containers.
- Do NOT leave equipment running unattended

**Safety:** NO STUDENT IS PERMITTED TO WORK ALONE IN A WORK AREA WITH MACHINE TOOLS OR HAZARDOUS MATERIAL PRESENT. Refer to the Safety Rules in your manual and posted in each Laboratory.
Academic Integrity

Students in this course are expected to maintain high ethical standards in all matters pertaining to the course, including, but not limited to, examinations, homework, course assignments, presentations, writing, laboratory work, team work, treatment of class members, and behavior in class. Cheating and plagiarism are violations of the SJSU Policy on Academic Dishonesty (S98-1) and will not be tolerated in the class. Students are expected to have read the Policy, which is available at:

http://www2.sjsu.edu/senate/S04-12.pdf

Plagiarism is defined as, the use of another person’s original (not common-knowledge) work without acknowledging its source.¹ Thus plagiarism includes, but is not limited to²:

- copying in whole or in part, a picture, diagram, graph, figure, etc. and using it in your work without citing its source
- using exact words or unique phrases from somewhere without acknowledgement
- putting your name on a report, homework, or other assignment that was done by someone else

Students are expected to familiarize themselves with how to avoid plagiarism. Several helpful resources can be found at:

http://www.stanford.edu/dept/vpsa/judicialaffairs/students/plagiarism.sources.htm

Course Goals

The overall goals for the course are to:

1. Provide senior students a capstone experience in design from concept to fabrication and validation of the final product.

2. Familiarize students with general industry practices, such as planning, scheduling, budgeting, part procurement, fabrication, assembly, and functional tests.

3. Develop students’ creative abilities in solving open-ended design problems.

4. Develop students’ engineering judgment as well as their confidence in making and accepting responsibility for design decisions.

5. Develop students’ oral and written communication skills necessary to describe the assumptions, methods, and results of engineering analysis, synthesis, and decision making associated with their design.

6. Make students aware of the importance of teamwork in the design of products and provide them with an opportunity to develop team and leadership skills.


7. Develop students’ understanding of professional practices, engineering ethics, as well as
global, environmental, and societal issues.

Learning Objectives for ME 195A

By the end of the course each student should be able to:

Design Skills

1. Apply the complete product development process including:
   - Defining the problem/societal need, carrying out market study/economic and budget analyses
   - Developing a complete set of functional specifications the design solution must meet
   - Generating solution concepts
   - Selecting the most promising design concept using structured methodologies
   - Developing design models and/or drawings for prototype and final design components
   - Procuring, fabricating, and assembling prototype and final design hardware
   - Evaluating, testing, and analyzing prototype and final design components and systems
   - Identifying future modifications and improvements that could be made to the design based on test data
   - Writing a project report and making presentations

2. Develop a schedule, and meet schedule and budget constraints.

3. Interact effectively with vendors, suppliers, and shop personnel.

Communication Skills

4. Write high quality design reports (i.e., using correct language and terminology, correct technical information, and professionally prepared graphs and tables).

5. Give clear, informative, technically correct oral presentations using professionally prepared visual aids.

Team Skills

6. Work harmoniously and effectively on a team to complete a design project.

Contemporary Issues

7. List several examples of contemporary issues related to their project, and articulate a problem statement or position statement for each.

8. Identify possible solutions to these contemporary problems, as well as any limitations of such strategies.

Global and Societal Issues

9. Evaluate and describe accurately the environmental impact of your product.

10. Evaluate and describe accurately any environmental and economic tradeoffs of your product.
11. Evaluate and describe accurately the health, safety, and economic tradeoffs of your product.

*Engineering Ethics*


13. Given a job-related scenario that requires a decision with ethical implications, identify possible courses of action, discuss the pros and cons of each one, and decide on the best one.

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**COURSE SCHEDULE**

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<thead>
<tr>
<th>Wk. No.</th>
<th>Date</th>
<th>Place</th>
<th>Activities</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>8/24</td>
<td>E189</td>
<td>General session on Overview of ME 195A</td>
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<tr>
<td>2</td>
<td>8/31</td>
<td>Labs</td>
<td>Individual sessions on project descriptions and team organization</td>
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<tr>
<td>3</td>
<td>9/7</td>
<td>Labs</td>
<td>Individual sessions on project proposals by individual teams and approval by instructors</td>
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<td>4</td>
<td>9/14</td>
<td>Labs</td>
<td>Project oral presentation No. 1. Individual sessions.</td>
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<tr>
<td>5</td>
<td>9/21</td>
<td>Labs</td>
<td>Project oral presentation No. 1. Individual sessions.</td>
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<tr>
<td>6</td>
<td>9/28</td>
<td>Labs</td>
<td>Project oral presentation No. 1. Individual sessions.</td>
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<tr>
<td>7</td>
<td>10/5</td>
<td>E189</td>
<td>Seminar on “Engineering Economics and Design” Quiz# 1, Individual sessions</td>
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<tr>
<td>8</td>
<td>10/12</td>
<td>Labs</td>
<td>Project oral presentation No. 2. Individual sessions.</td>
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<tr>
<td>9</td>
<td>10/19</td>
<td>Labs</td>
<td>Project oral presentation No. 2. Individual sessions.</td>
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<tr>
<td>10</td>
<td>10/26</td>
<td>Labs</td>
<td>Project oral presentation No. 2. Individual sessions.</td>
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<tr>
<td>11</td>
<td>11/2</td>
<td>E189</td>
<td>Video presentation &amp; Seminar on “Engineering Ethics in Design &amp; Practices.” Quiz #2, Individual sessions</td>
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<tr>
<td>12</td>
<td>11/9</td>
<td>E117</td>
<td>Instructors’ meeting – no formal sessions.</td>
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<td>13</td>
<td>11/16</td>
<td>Labs</td>
<td>Project oral presentation No. 3. Individual sessions.</td>
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<tr>
<td>14</td>
<td>11/23</td>
<td>Labs</td>
<td>Project oral presentation No. 3. Individual sessions.</td>
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<tr>
<td>15</td>
<td>11/30</td>
<td>Labs</td>
<td>Project oral presentation No. 3. Individual sessions.</td>
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<tr>
<td>16</td>
<td>12/7</td>
<td>Labs</td>
<td>Planning for ME 195B in Spring 2011</td>
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**Important Notes:**

1. Each project team will make at least three oral presentations during the scheduled individual section meetings at times to be arranged by the section instructor.

2. Students’ attendance of scheduled individual and general sessions is mandatory. Absence from these sessions without the Section Instructor’s permission will affect a student’s overall marks.

*(Syllabus ME195A F11)*