Prerequisites: ME 195A with Grade C- or better
Credit Units: 3 units
Class hours: Wednesdays, 1:30 – 4:15

Instructors/Meeting Room: Section 1 (48861): Prof. Raghu Agarwal, Room E135
Section 2 (48862): Prof. Tai-Ran Hsu, Room E111 and 117
Section 3 (48863): Prof. Eric Hagstrom (with Prof. Buff Furman)
Engr 133 and 128 E. John St (between 3rd and 4th Streets)
Section 4a (48864): Prof. Zaidi, Room E114a
Section 4b (48864) Prof. Mokri, Room 192
Section 5 (50352) Prof. Viswanathan, Room E141

Course coordinator: Professor Nicole Okamoto (E-mail: Nicole.okamoto@sjsu.edu)

This course satisfies SJSU Studies areas S and V when taken in conjunction with Engr 195a/b and ME 195a. You must receive a “C” or better in all four courses to get GE credit.

Course Description
Second half of a one-year team project carried out under faculty supervision. Project will proceed from problem definition to analysis, design and validation, experimentation including possible construction and testing.

Grading
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 oral presentations on achievements and timely progress
- (15%) Writing assignments and monthly progress reports, etc. (5%, 3%, and 2% for writing assignments 1, 2, and 3 respectively. The remaining 5% is at the discretion of the individual instructor and may include monthly progress reports, quizzes, etc.)
- (45%) End-of-semester report and accomplishments (including prototype)
- (15%) Individual performance evaluation

Grade Distribution

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Score</th>
<th>Maximum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td>A- 90-92.9</td>
</tr>
<tr>
<td>B+</td>
<td>87-89.9</td>
<td>B- 80-82.9</td>
</tr>
<tr>
<td>C+</td>
<td>77-79.9</td>
<td>C- 70-72.9</td>
</tr>
<tr>
<td>D+</td>
<td>67-69.9</td>
<td>D- 60-62.9</td>
</tr>
</tbody>
</table>
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 EQUIPMENT OR HAZARDOUS MATERIAL PRESENT. Refer to the Safety Rules in your manual and posted in each Laboratory.

E123 Shop Access
The shop in E123 will be made available for students for fabrication purposes during the hours posted on the door. Access beyond those hours for assembly purposes only (no machining) will be granted on a case-by-case basis by petition. Access to the shop will be given under two circumstances: 1) you have taken ME/Tech 41 and received a B- or better, or 2) you can demonstrate the ability to run the machinery safely. Please see the department office for forms to request access.

University Policies
Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/”

Expected Time Commitment
According to university rules: “Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

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, 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 and societal issues.

Learning Objectives

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.

Environmental, Economic, and Safety 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.

GE Learning Objectives

12. Area V SLO #1: Students shall be able to compare systematically the ideas, values, images, cultural artifacts, economic structures, technological developments, or attitudes of people from more than one culture outside the U.S.

13. Area V SLO #2: Students shall be able to identify the historical context of ideas and cultural traditions outside the U.S. and how they have influenced American culture.
14. Area V SLO #3: Students shall be able to explain how a culture outside the U.S. has changed in response to internal and external pressures.

**COURSE SCHEDULE (subject to change)**

<table>
<thead>
<tr>
<th>Wk. No.</th>
<th>Date</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2/1</td>
<td>General session on Overview of ME 195B. Individual sessions.</td>
</tr>
<tr>
<td>2</td>
<td>2/8</td>
<td>Individual sessions</td>
</tr>
<tr>
<td>3</td>
<td>2/15</td>
<td>Individual sessions</td>
</tr>
<tr>
<td>4</td>
<td>2/22</td>
<td>Individual sessions</td>
</tr>
<tr>
<td>5</td>
<td>3/1</td>
<td>Project presentation No. 1</td>
</tr>
<tr>
<td>6</td>
<td>3/8</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>7</td>
<td>3/15</td>
<td>Instructor’s Meeting – no scheduled sessions</td>
</tr>
<tr>
<td>8</td>
<td>3/22</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>9</td>
<td>3/29</td>
<td>Spring Break – No classes</td>
</tr>
<tr>
<td>10</td>
<td>4/5</td>
<td>Project Presentation No. 2</td>
</tr>
<tr>
<td>11</td>
<td>4/12</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>12</td>
<td>4/19</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>13</td>
<td>4/26</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>14</td>
<td>5/3</td>
<td>Individual sessions.</td>
</tr>
<tr>
<td>15</td>
<td>5/10</td>
<td>Preparation for Student Conference Day</td>
</tr>
<tr>
<td></td>
<td>5/12</td>
<td>Conference Day Presentations</td>
</tr>
</tbody>
</table>

**Conference Day Presentation: Friday, May 12 2016**

**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’ participation in ALL scheduled individual and general sessions is mandatory unless they have a university-authorized excuse. Absence from these sessions without the Section Instructor’s permission will affect a student’s individual performance evaluation.
3. Note that Conference Day is on a Friday. You are expected to attend your entire session, which typically will run most of the morning or afternoon. If you have an unavoidable conflict, discuss with your instructor at the beginning of the semester.

**General Education Meetings**

Students taking Engr 195a/b are required to have sessions with their senior project faculty during the off weeks of that class. There is one written assignment for each of these three sessions. These assignments are required for all ME 195a students. For the few students who are not enrolled in Engr 195a, it is encouraged that you attend these meetings since it will make the assignments easier. However, after the meetings enough materials will be posted on the ME 19b website that you will be able to complete the assignments without attending the meetings on 2/24 and 3/24.
### Engr 195a meetings with ME 195a

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Assignment Due</th>
<th>Location</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 24 12-1:15</td>
<td>Wed., March 8 @ 1:30</td>
<td>Engr 189</td>
<td>Seminar: Global Economy and Social Impacts</td>
</tr>
<tr>
<td>March 24 12-1:15</td>
<td>Friday, April 7 @ 1:30</td>
<td>Engr 189</td>
<td>Engineering Ethics Case Studies</td>
</tr>
<tr>
<td></td>
<td>April 26 @ 1:30</td>
<td>online</td>
<td>ME Inventions that Have Changed Society</td>
</tr>
</tbody>
</table>