ME 195A Senior Design Project

Fall 2015

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.

For students beginning continuous enrollment in Fall 2005 or later, completion of, or co-registration in, a 100W course is required for enrollment in all SJSU Studies courses.

To receive credit for GE Areas S and V, students must complete both Engr 195A and Engr 195B, each with a grade of C or better. In addition, they must complete their senior project course sequence and earn a grade of C or better in each course (ME 195A and ME 195B).

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

Credit Units: 3 units

Class hours: Wednesdays, 1:30 – 4:15 PM

Instructors/Meeting Room: Section 1 (40292): Prof. R. Agarwal, Room E135
Section 2 (40293): Prof. B. Furman, Room E133
Section 3 (40294): Prof. W. Du, Room E192
Section 4 (40594): Prof. N. Okamoto, Room E114
Section 5 (50007): Prof. R. Yee, Room E111

Course coordinator: Professor Buff Furman (E-mail: burford.furman@sjsu.edu)

Office hours: Check with instructors

This course satisfies SJSU Studies area S when taken with Engr 195A/B.

COURSE DESCRIPTION:
First 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.

Required Text: None

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

- (45%) End-of-semester report and accomplishments
- (25%) Delivery of at least three presentations on achievements and meeting project schedule milestones
- (15%) Writing assignment and monthly progress reports
- (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

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**Machine Shop Use**

You must have passed ME 41 or have been checked out by our technician, Roger Jue, to be eligible to receive access to the machine shop. Please see Lilly Wilderman in the ME office to fill out paperwork to get an access code. You MUST bring engineering drawings with you to use the machine tools in the shop.

**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.

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**University Policies**

**Academic integrity**

Your commitment as a student to learning is evidenced by your enrollment at San José State University. The University’s Academic Integrity policy, located at [http://www.sjsu.edu/studentconduct/docs/S07-2.pdf](http://www.sjsu.edu/studentconduct/docs/S07-2.pdf), requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at [http://www.sjsu.edu/studentconduct/](http://www.sjsu.edu/studentconduct/).

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy S07-2 requires approval of instructors.

**Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please visit your instructor in office hours or make an appointment as possible. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the AEC (Accessible Education Center) at [http://www.sjsu.edu/aec/](http://www.sjsu.edu/aec/) to establish a record of their disability.

**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, 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.

**Global and Societal Issues**

7. Describe historical, social, political, and economic processes producing diversity, equality, and structured inequalities in the U.S. (GE Area S LO #2)
• Describe the global, social or cultural influences that have led to a need for their project.

• Describe the effects of their project on society locally and/or globally.
• Evaluate and describe in detail the environmental impact of their project.
• Evaluate and describe in detail any environmental and economic tradeoffs of their project.
• Evaluate and describe in detail the health, safety, and economic tradeoffs of their project and how the project affects quality of life for the public.

COURSE SCHEDULE

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<thead>
<tr>
<th>Wk.</th>
<th>Date</th>
<th>Place</th>
<th>Activities</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>8/26</td>
<td>E189</td>
<td>General session: Overview of ME 195A</td>
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<tr>
<td>2</td>
<td>9/2</td>
<td>Labs</td>
<td>Individual sessions on project descriptions and team organization</td>
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<td>3</td>
<td>9/9</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>9/16</td>
<td>E189</td>
<td>Seminar: Impact of Technology on Society, Writing Assignment</td>
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<td>5</td>
<td>9/23</td>
<td>Labs</td>
<td>Project oral presentation No. 1. Individual sessions</td>
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<td>6</td>
<td>9/30</td>
<td>Labs</td>
<td>Project oral presentation No. 1. Individual sessions</td>
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<tr>
<td>7</td>
<td>10/7</td>
<td>Labs</td>
<td>Individual sessions</td>
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<tr>
<td>8</td>
<td>10/14</td>
<td>Labs</td>
<td>Team/instructor: Discussions on writing assignment</td>
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<td>9</td>
<td>10/21</td>
<td>Labs</td>
<td>Project oral presentation No. 2. Individual sessions</td>
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<tr>
<td>10</td>
<td>10/28</td>
<td>Labs</td>
<td>Project oral presentation No. 2. Individual sessions</td>
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<tr>
<td>12</td>
<td>11/11</td>
<td>Labs</td>
<td>Instructors’ Meeting – No formal sessions</td>
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<td>13</td>
<td>11/18</td>
<td>Labs</td>
<td>Project oral presentation No. 3. Individual sessions</td>
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<td>14</td>
<td>11/25</td>
<td>Labs</td>
<td>Individual Sessions</td>
</tr>
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<td>15</td>
<td>12/2</td>
<td>Labs</td>
<td>Project oral presentation No. 3. Individual sessions; Planning for ME 195B; Review</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’ participation in scheduled individual and general sessions is mandatory unless you have a university-authorized excuse or have made arrangements in advance with your instructor.

SJSU Senate Policy S12-3 - Federal Regulation of the definition of the credit hour:
Success in this course is based on the expectation that a student will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week with one of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica, etc. Other course structures will have equivalent workload expectations as described in the syllabus. [Thus, for this class, plan to spend at least eight hours per week outside of class meetings working on your project.]