

**San José State University**  
**Department of Electrical Engineering**  
**EE 198A, Senior Design Project I, All Sections, Spring , 2018**

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<b>Office Hours:</b>	Thursday 4pm-5pm.
<b>Class Days/Time:</b>	F 10am-12:45pm (Lab)
<b>Classroom:</b>	ENGR345
<b>Prerequisites:</b>	<b>EE Senior in good standing, ENGR 100W with a C or better, EE120, EE122, and EE128 with a C- or better</b>
<b>Co-requisites (These courses allow you to learn some of the skills required to do a real design. These are suggested, not required) :</b>	<ol style="list-style-type: none"><li>1. Analog Circuit design: 124, 223, 129, 174</li><li>2. Digital Circuit Design: 174, 178, 138</li><li>3. Signal Processing: 153, 161</li><li>4. Integrated Circuit: 129, 166</li><li>5. MEMS: 129, 169</li><li>6. Electromagnetic microwave: 172</li><li>7. Control/ Power Systems: 130, 132</li></ol>

### **Course Description**

Team Design Project Proposal, Business Plan, Oral Design Presentations of the initial phases of the Design Project, a written and oral defense of the proposed Design Project. Global and Social Issues in Engineering. Individual written reports on Professional Development plans. GE Area: S when taken as part of EE major sequence.

Prerequisite: EE Senior in good standing in Major, ENGR 100W (with grade of "C" or better), ENGR100W, EE120, EE122, and EE128 (with grades of "C-" or better. Passage of the Writing Skills Test (WST) or ENGL/LLD 100A with a "C or better" (C- not accepted), completion of Core General Education and upper division standing are prerequisites to all SJSU studies courses. Completion of, or co-registration in,

Co-requisite: ENGR 195A

Misc/Lab: Lab 3 hours.

Note: Meets GE Areas S and V when course is taken in combination with: EE 198B, ENGR 195A and ENGR 195B

### **Course Goals and Student Learning Objectives**

Upon successful completion of this course, students will be able to:

1. Design a system, device or component (c,k)
2. Fabricate a system, device or component (c,k )
3. Test a system, device or component(c ,k)
4. Work in a team (d)
5. Research an Electrical Engineering topic (i)
6. Estimate the ethical implications of an engineering project (f)
7. Write individual engineering reports (g)
8. Write final Engineering Team reports(g)
9. Orally present Engineering ideas and results(g,h)
10. Prepare a literature review (i,j)
11. Prepare a five year plan for to achieve professional goals (i,j)

### **GE/SJSU Studies Learning Outcomes (LO), if applicable**

Upon successful completion of this course, students will be able to:

- GELO1: Describe how identities (i.e. religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age) are shaped by cultural and societal influences within contexts of equality and inequality;
  - ENGR 195A Reflection Paper 3 (700words): In this reflection paper, you are to critically engage the topic of the social construction of identity in your life. Please discuss and provide examples of how at least one of your identities (i.e., religious, gender, ethnic, racial, class, sexual orientation, disability and/or age, among others) is shaped, or has been shaped, by cultural and societal influences within contexts of equality and inequality. Please integrate course material (concepts, theories, discussions, lectures, readings). Please cite at least one course reading.
  - *EE 198A SLO 1: 5 Year Plan*: Based upon the lecture “Career Conversations & Professional Skill Development” and consider your identity, design a 5-year career plan. (minimum **500 words**)
- GELO2: Describe historical, social, political, and economic processes producing diversity, equality, and structured inequalities in the U.S.;
  - ENGR 195A Reflection paper 2 (700 words): Consider technological innovations and developments in your field. In your paper: 1) Describe, in detail, an example of how one such innovation/development (using any example that you want post-1970) has either increased or decreased environmental or social justice and inequality in the U.S. Make sure to discuss what the technological development is and its environmental or social consequence(s). 2) Looking forward, can you predict any other possible unintended environmental and/or consequences from this branch of technology? 3) Next, discuss how your current or past projects have or will contribute to environmental and/or social justice or injustice in the United States. Include at least two citations. You can cite two course readings or you can have one citation from a course reading and one citation from the movie "Secrets of Silicon Valley." Either way you need two. Citing lecture will not count as one of these citations for this paper.
  - *EE198A SLO 2*. Using the material provided in ENGR195A, describe how your project fits into the historical, social, political, and economic

processes producing diversity, equality, and/or structured inequalities in the U.S. (minimum 400 words).

- GELO3: Describe social actions which have led to greater equality and social justice in the U.S. (i.e. religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age).
  - ENGR 195A Reflection paper 2 (700-800 words): Consider technological innovations and developments in your field. In your paper: 1) Describe, in detail, an example of how one such innovation/development (using any example that you want post-1970) has either increased or decreased environmental or social justice and inequality in the U.S. Make sure to discuss what the technological development is and its environmental or social consequence(s). 2) Looking forward, can you predict any other possible unintended environmental and/or consequences from this branch of technology? 3) Next, discuss how your current or past projects have or will contribute to environmental and/or social justice or injustice in the United States. Include at least two citations. You can cite two course readings or you can have one citation from a course reading and one citation from the movie "Secrets of Silicon Valley." Either way you need two. Citing lecture will not count as one of these citations for this paper.
  - EE198A SLO3. : Describe how the push for a lead free standard in electronic products (RoSH) increased social justice in the US. (minimum **750 words**)
  
- GELO4: Recognize and appreciate constructive interactions between people from different cultural, racial, and ethnic groups within the U.S.
  - Engr 195A Reflection Paper 3 (**500 words**): Students will read excerpts from Ernest Callenbach's *Ecotopia*. Students will apply this reading to their current lived experience in the U.S. Beyond fulfilling the S-LO4, students will address the specific course learning objective "identify, compare, and contrast how local community organizations, groups, and agencies address social issues relevant to the environment and quality of life in the Santa Clara Valley" by comparing one element in our current society to Callenbach's described society.

### **Course Content Learning Outcomes**

- The students are able to apply knowledge and skills acquired in earlier coursework to identify, formulate, and propose a sound solution to an engineering problem (c,k)
- The students have an understanding of ethics, social implication of engineering, and the need for life-long-learning (i,f)
- The students can function in teams and can communicate effectively. (g)
- The students can describe and use industry standards (c)

### **Topics:**

- Engineering ethics.
- Social implications of Engineering.

- Team work and life-long learning
- Communication skills
- Career objectives and interviewing
- Industry standards

### **ABET outcomes**

The letters in parentheses in the course learning objectives refer to ABET criterion 3 outcomes satisfied by the course. These are listed below as a reference:

- (a) An ability to apply knowledge of mathematics, science, and engineering
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data
- (c) An ability to design a system, component, or process to meet desired needs
- (d) An ability to function on multi-disciplinary teams
- (e) An ability to identify, formulate, and solve engineering problems
- (f) An understanding of professional and ethical responsibility
- (g) An ability to communicate effectively
- (h) The broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) A recognition of the need for, and an ability to engage in life-long learning
- (j) A knowledge of contemporary issues
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- (l) Specialization in one or more technical specialties that meet the needs of companies
- (m) Knowledge of probability and statistics, including applications to electrical engineering
- (n) Knowledge of advanced mathematics, including differential and integral equations, linear algebra, complex variables, and discrete mathematics
- (o) Basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components

### **Required Texts/Readings**

#### **Textbook**

NA

## Other Readings

### Classroom Protocol

#### Cell Phones:

Students will turn their cell phones off or put them on vibrate mode while in class. They will not answer their phones in class. Students whose phones disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University.

#### Computer Use:

In the classroom, students are allowed to use computers only for class-related activities. These include activities such as taking notes on the lecture underway, following the lecture on Web-based PowerPoint slides that the instructor has posted, and finding Web sites to which the instructor directs students at the time of the lecture. Students who use their computers for other activities or who abuse the equipment in any way, at a minimum, will be asked to leave the class and will lose participation points for the day, and, at a maximum, will be referred to the Judicial Affairs Officer of the University for disrupting the course. (Such referral can lead to suspension from the University.) Students are urged to report to their instructors computer use that they regard as inappropriate (i.e., used for activities that are not class related).

### Expected time commitment

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 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.

### Assignments and Grading Policy

#### Outcome Assessment (Grading):

- **25% Area S** Students must pass this part of the course with a 74% to receive Area S GE credit.
  - **Five-year plan.** consider your identity as a future engineer. How is your identity as an engineer shaped by cultural and societal influences within contexts of equality and inequality? **(Individual)**
  - **Your project's implication in area S.** describe how your project fits into the historical, social, political, and economic processes producing diversity, equality, and/or structured inequalities in the U.S. **(Individual)**
  - **Essay 3.** Describe how the push for a lead free standard in electronic products (RoSH) increased social justice in the US. **(Individual)**
- 10% Pre-proposal.
- 15% Individual Effort (Adviser Evaluation)
- 10% Midterm report (Adviser Evaluation)
- 10% Business plan
- 10% Oral Presentation.
- 20% Written Final Proposal.

### Percentage Breakdown

94% and above	A
93% - 90%	A-
89% - 87%	B+
86% - 84%	B
83% - 80%	B-
79% - 77%	C+
76% - 74%	C
73% - 70%	C-
69% - 67%	D+
66% - 64%	D
63% - 60%	D-
below 60%	F

### **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/>

## Course Schedule

**Table 1 Course Schedule (Subject to change with fair notice as announced by instructor in class)**

Week	Date	EE198A
1	1/26/2018	Introduction, Professor's research areas. Group organization.
2	2/2/2018	Group organization. Pre-proposal organization
3	2/9/2018	Area S: lecture on identity and career plan <b>Due: Proof of meeting prerequisite</b>
4	2/16/2018	Area S: lecture on identity and career plan Meeting with business students on 2/13 from 4:00~4:30 in MLK217 or in class on 2/16 from 11:30 to 12:00. <b>Due: Pre-proposal (group assignment)</b>
5	2/23/2018	Mini-presentation <b>Due: Five-year plan (Essay 1)</b>
6	3/2/2018	No formal class. Meet with project advisor
7	3/9/2018	No formal class. Meet with project advisor
8	3/16/2018	Presentation about essay 2 and 3 (Prof. Backer) <b>Due: Midterm report (group assignment)</b>
9	3/23/2018	Lecture on Business plan (Prof. Quan of Business College) <b>Due: "Your project's implication in Area S". (Essay 2)</b>
10	3/30/2018	Spring break
11	4/6/2018	Meet with advisor, No formal class
12	4/13/2018	No formal class. Meet with project advisor <b>Due: Business plan (group assignment)</b>
13	4/20/2018	Effective oral presentation and written proposal <b>Due: Lead-free Essay (Essay 3)</b>
14	4/27/2018	Oral Proposal Presentations
15	5/4/2018	Oral Proposal Presentations <b>Due: Written proposal (group assignment)</b>
16	5/11/2018	Oral Proposal Presentations (if needed).

