Instructor: David Wahlgren Parent
Office Location: ENGR 355
Telephone: (408) 924-3963
Email: david.parent@sjsu.edu
Class Days/Time: F 12:00-14:45
Classroom: ENGR 339
Prerequisites: EE Senior in good standing, ENGR 100W with a C or better, EE120, EE122, and EE128 with a C- or better
Corequisite: Engr 195A Global and Social Issues in Engineering
Suggested Courses:
1. Analog Circuit design: 124, 125, (129 or 225a)
2. Digital Circuit Design: 176, 177, 178
4. Intergraded Circuit: 128, 129, 166, 167
5. MEMS: 129, 169
6. Electromagnetic microwave: 172, 196Z
7. Control/ Power Systems: 130, 132

Catalog Description

Course Description
This course is the first course in a two-semester sequence in which each student will work in a group of 2 – 5 on a specific design project in Electrical Engineering. The focus of this course will be on creating an initial design and a proposal for the project and integrating social and global issues into your design project.

In the College of Engineering at SJSU, we believe that it is critical that engineering students integrate the GE student learning outcomes into their engineering studies. In your senior project course and the Engr 195A course, you will be challenged to understand the relationship of engineering to the broader community both in the U.S. and worldwide. In addition to the assignments in Engr 195A, the engineering faculty have created linked activities in your senior project course that allows you to apply these concepts to your engineering discipline.
**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)
12. Discuss the role of identity, equality, social actions, and culture in solving technical problems. (Integration of Area S and Engineering.)

**GE/SJSU Studies Learning Outcomes (LO)**

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

**S-LO1:** 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 Testimony 1:** Discuss and provide examples of how your identities (i.e., religious, gender, ethnic, racial, class, sexual orientation, disability and/or age, among others) are shaped by cultural and societal influences within contexts of equality and inequality (250-500 words).
- **ENGR 195A Testimony 2:** How does language affect our identities? How do we use language and labels to authenticate our identities to others and ourselves? (250-500 words)
- **EE 198A Testimony 1:** Based upon your response to Engr 195A Testimony 1, 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? (250-500 words)

**S-LO2:** describe historical, social, political, and economic processes producing diversity, equality, and structured inequalities in the U.S.;

- **Engr 195A Reflection paper 2:** “Secrets of Silicon Valley” reflection paper (250 words)
- **EE 198A Reflection paper 2:** Using the case studies provided in ENGR195A/B, describe how your project fits into the historical, social, political, and economic processes producing diversity, equality, and structured inequalities in the U.S. (500-750 words)

**S-LO3:** 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); and

- **ENGR 195A Reflection paper 1:** Describe social actions within the borders of the United States that have led to greater equality and social justice in your life (i.e., religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age). Discuss how your current or past projects have or will contribute to social justice in the United States (750-1250 words).
- **Engr 195A Reflection Paper 2:** In his essay, Dyson gives some historical examples of technological innovations that he claims have increased social justice. Considering the technological innovations in your discipline, please describe another example and indicate how it has increased social justice in the U.S. (250-500 words)
- **EE 198A Reflection paper 1:** Describe how the push for a lead free standard in electronic products (RoSH) increased social justice in the US. (250-500 words)
S-LO4: recognize and appreciate constructive interactions between people from different cultural, racial, and ethnic groups within the U.S.

- Engr 195A Website Analysis: Organization Website Analysis Environmental and social justice issues are addressed at many different levels and in different ways by groups and organizations. This assignment addresses the broad GE learning objective of “recognizing and appreciating constructive interactions between people from different cultural, racial, and ethnic groups in the U.S.” and the specific course learning objective to “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. (750 words)

- EE 198A essay: Consider a negative side effect of technology: ewaste. Read the following articles and answer the questions in paragraph form. Your essay must cite your sources and be at least 500 words.

Articles:

Essay Instructions: Research the procedures regarding ewaste in your own town or region. What civic organizations promote the reduction of ewaste in your community? Either visit one of these groups’ websites or visit the group in person and describe the interactions between this group and the larger community.

**Engr 198A 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)
- The students can describe the social and global impact of engineering on society (h)

**Topics:**
- Engineering ethics.
- Social and global impact 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: Additional readings for this class are available on the Canvas website. The
timeline for these readings is shown in the attached calendar.

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).

Academic Honesty:
Faculty will make every reasonable effort to foster honest academic conduct in their courses. They will secure examinations and their answers so that students cannot have prior access to them and proctor examinations to prevent students from copying or exchanging information. They will be on the alert for plagiarisim. Faculty will provide additional information, ideally on the green sheet, about other unacceptable procedures in class work and examinations. Students who are caught cheating will be reported to the Judicial Affairs Officer of the University, as prescribed by Academic Senate Policy S04-12.

“You are responsible for understanding the policies and procedures about add/drops, academic renewal, withdrawal, etc. found at http://www2.sjsu.edu/senate/S04-12.pdf

• Expectations about classroom behavior; see Academic Senate Policy S90-5 on Student Rights and Responsibilities.

• As appropriate to your particular class, a definition of plagiarism, such as that found on Judicial Affairs website at http://www2.sjsu.edu/senate/plagarismpolicies.htm

• “If you would like to include in your paper any material you have submitted, or plan to submit, for another class, please note that SJSU’s Academic Integrity policy

Dropping and Adding
Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Information on add/drops are available at http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-298.html. Information about late drop is available at http://www.sjsu.edu/sac/advising/latedrops/policy/. Students should be aware of the current deadlines and penalties for adding and dropping classes.

Assignments and Grading Policy
Outcome Assessment (Grading):
• Go/No Go In class skill-audit exam. Students must pass this exam with an 80% or greater to receive their 198A grade. Students must take on-line skill audit exam before attempting in class exam. Students will be given as many opportunities as they need to pass the exam.

• 5% Seminar Attendance. You must attend:
  o Each 198A meeting
  o One session of EE198B final project presentations (on the “dead day” between the last day of class and the first day of exams.
  o Two Silicon Valley Leader Symposia in room 189, (every Thursday from 12 to 1pm for details go to http://www.engr.sjsu.edu/speakers/ ) You can make up the presentations with extra 198B or EE297/299 presentation sessions. You will have to submit one paragraph describing what you learned at each symposium. (Individual)

• 30% Written Final Proposal. Your proposal will be judged by your project advisor and one other EE faculty member. (Group)

1 Note: You will not receive the group grade, if you have not participated in the group work.
• 10% Business Plan – This Plan must be approved by the Coordinator and outside evaluators before the project may continue (Group)
• 30% Reflection Papers and Activities related to social and global issues (Individual)
• 5% Where do I want to be in 5 years and how am I going to get there? (Individual)
• 20% Oral presentation. Your presentation will be judged by your project advisor, one other EE faculty member (Group)

There are no I grades given for “running out of time”. All assignments will be turned in on Canvas. All assignments will be graded according to the rubrics provided in “Canvas”

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.

Grading Percentage Breakdown

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>94% and above</td>
<td>A</td>
</tr>
<tr>
<td>93% - 90%</td>
<td>A-</td>
</tr>
<tr>
<td>89% - 87%</td>
<td>B+</td>
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<tr>
<td>86% - 84%</td>
<td>B</td>
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<td>66% - 64%</td>
<td>D</td>
</tr>
<tr>
<td>63% - 60%</td>
<td>D-</td>
</tr>
<tr>
<td>below 60%</td>
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University Policies

Academic integrity

Students should know that the University’s Academic Integrity Policy is available at http://www.sa.sjsu.edu/download/judicial_affairs/Academic_Integrity_Policy_S07-2.pdf. Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University’s integrity policy, require 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 website for Student Conduct and Ethical Development is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

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 in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy F06-1 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 make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the DRC (Disability Resource Center) to establish a record of their disability.

Description of Class Activities

*Social and Global Impacts of Engineering* (see description of these activities above)

- EE 198A Testimony 1
- EE 198A Reflection paper 2
- EE 198A Reflection paper 1
- EE 198A assignment

*First Report:* You consider this report as interview preparation. Select companies that you want to work for, and who are going to attend the career day fair, and target them.

Housekeeping:

- Report should be at least 2 pages (No More than 3)
- Headings in “14” type
- Report in “12” type
- Double Spaced
- The report will be graded on how well you support your plan and grammar.

*Where do I want to be professionally in 5 years, and how am I going to get there?*

**Abstract:** Tell me everything that I *NEED* to know about this report. (Paragraph)

**Introduction:** Furnish the background material needed for me to understand the body of the report. You can give a brief history of yourself if it supports where you want to be in five years. This should not take up more than two paragraphs.

**Body:** Where do you want to be professionally in 5 years and how are you going to get there, and how are you going to keep that skillset? (2 Pages maximum)

*You consider this report as interview preparation. Select companies that you want to work for, and who are going to attend the career day fair, and target them.*

You need to be as specific as possible. If you are going to grad school, name the degree type (MBA, MSEE, Mixed, Fine Arts etc..). Why you want that degree. Which school do you want to go and why. Support your choices which some research (mentors, web, professors, IEEE spectrum).

If you want to work for a company be specific as you can. (National Maxim etc..) What kind of job do you want? (design, product, sales, management)

Specifically state what kinds of products do you want to be involved with? (You cannot just say digital or analog.)

**Summary:** In one paragraph summarize what you just told me.
Business Plan:

(1) **The Executive Summary**

This is a 1 page (maximum) section that summarizes all of the other sections listed next. Some
readers read only the Executive Summary, and some read the Executive Summary to decide
whether to read the rest of the plan.

(2) **The Opportunity**

What is the need/opportunity? What is the business concept that will address this need or take
advantage of the opportunity? Is the market large and growing? Or is it a small niche market
but you expect it to grow?

(3) **The Industry**

What’s the nature/degree of competition in the industry? Who are the main competitors? How
will the company differentiate itself from the competition?

(4) **The Proposed Business Concept**

Is the proposed product or service (the solution to the problem) clearly explained? What are its
unique features? Its merits? Its limitations? Is it realistic and viable? To what extent is the
product or service a compelling purchase for the customer?

(5) **Market Research & Analysis**

Who is the new venture’s customer? Where are customers located? How does the customer
make decisions about buying this product or service?

(6) **Marketing Plan**

How will the product/service be priced? How will the product/service be distributes, delivered,
and sold?

(7) **Finance & Economics**

How much money will the venture require? What sources of finance? How/When will the
venture make money?

(8) **Management Team**

How will the team contribute to the success of the business? (In terms of their background and
skills).

(9) **A brief summary of the Risks & Assumptions**

The Plan **MUST** confront the risk ahead ‘what if … …?’
(10) **Ethics**, Use [ethical score](#) card as a launching point for the ethical implications of your project. You should justify any score that is not a three. If your score is below 50%, you need to show how you changed what you did to improve the ethics of your project.

**Written Final Proposal**

**Abstract:** In approximately 100 words or less, tell me everything I need to know about your project.

**Introduction:** The background of the problem you are trying to solve. What is the closest product on the market that competes with your project? Why should I buy yours? Is it faster, smaller, cheaper, takes less power etc.? Why does Society need your product (even if your project is a subsystem of another product)?

**Specifications:** **ALL** the design parameters/specifications that will let us know if your final design project will be successful.

**Methodology:** Analysis of the problem, possible solutions, optimum solution. Why is it optimum? What parameters make it optimum? What assumptions were made in the analysis?

- **Body:**
  - Block Diagram of the Solution
  - Circuits Components List
  - Cost; who is going to pay the cost?
  - Time Schedule for next Semester
  - How will conflicts between personnel be managed?
  - How is it going to be tested?
  - Bibliography
  - The various skillsets that enable this team to solve the problem.

**Contract:** A one page contract listing all the deliverables with specifications and signatures.

**Summary:** In 200 words or less tell me what you just told me.

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Item Due</th>
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<tbody>
<tr>
<td>1</td>
<td>8/23/2013</td>
<td>First Day</td>
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<tr>
<td>2</td>
<td>8/30/2013</td>
<td>Professor's Pitch</td>
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<tr>
<td>3</td>
<td>9/6/2013</td>
<td>Professor's Pitch</td>
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<tr>
<td>4</td>
<td>9/13/2013</td>
<td>Cypress PSOC</td>
<td>Paper 1 (Where I want to be in 5 years.)</td>
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<td>9/20/2013</td>
<td>How to do References</td>
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<td>6</td>
<td>9/27/2013</td>
<td>Ethics and team work</td>
<td>EE 198A Testimony 1</td>
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<td>10/4/2013</td>
<td>Engineering Standards</td>
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<td>8</td>
<td>10/11/2013</td>
<td>Students Present Project Idea</td>
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<td>9</td>
<td>10/18/2013</td>
<td>Transition from College to Career: Steps to Prepare for the Workforce</td>
<td>Jill Klees</td>
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<td>Skill Audit Exam 1</td>
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<tr>
<td>13</td>
<td>11/15/2013</td>
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<td>11/22/2013</td>
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<td>15</td>
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<td>12/6/2013</td>
<td>Final Proposal Due</td>
<td>Final Proposal &amp; EE 198A Reflection Paper 2 Due</td>
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