

**San José State University**  
**Department of Electrical Engineering**  
**EE 97 Introductory Electrical Engineering Laboratory,**  
**Fall 2018**

**Course and Contact Information**

**Instructor** Khosrow Ghadiri  
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**Office Hours** Tu 1200-1300, Th 1200-1300, 1700-1800  
**Classroom:** ENG 249

**Class day/time**

Sec	Class day/ time
01	Th 1800-2045
02	Tu 0900-1145
03	Tu 1330-1615
04	Th 1330-1645
05	Fr 0900-1145
06	Th 0900-1145

**Prerequisites:** Co-requisite: EE 98

**Lab Coordinator** Ping Hsu. ENGR257, [ping.hsu@sjsu.edu](mailto:ping.hsu@sjsu.edu), (408) 924-3902

**Course Description**

Basic instruments and experimental techniques in electrical engineering. Measurements of voltage, current, frequency response, and transient response using oscilloscopes, function generators, frequency counters and multiple-function meters.

**Course Goals and Student Learning Objectives**

The course covers the following topics.

**Topics**

- Measurement of voltage, current, resistance, and frequency response.
- The use of oscilloscope, digital multimeter, function generator, and DC power supplies.
- Electrical components including resistors, capacitors, inductors, transformers, diodes, transistors and integrated circuits.
- Sources and the Thevenin model including a battery, DC power supply and function generator. Half- and full-wave rectifier circuits illustrate

measurement of both DC and AC components of a voltage. Relations between mean, RMS, peak and peak-to-peak voltages are explored.

- An oscillator built with an NE555 timer IC uses the time constant of exponential decay in an RC circuit.
- Operational-amplifier circuits, LC resonance, amplitude modulation and demodulation are used in a simple radio receiver.
- Written lab reports provide practice in clear descriptions of procedures, simple analysis of data and conventions engineers are expected to follow in presenting results.

### **Course Content Learning Outcomes**

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

- a. read circuit schematics (2,3)
- b. build simple circuits (1,2,6)
- c. use DC power supplies, digital multimeters, function generators, and oscilloscopes (2,6)
- d. measure voltage, current, resistance, and frequency response (2,6)
- e. design simple circuits (1,2)
- f. devise simple experiments (1,2,6)
- g. work in a group (5)
- h. prepare technical documents, lab reports (3)

### **ABET outcomes**

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

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Required Texts/Readings

### Textbook

*EE 97 Laboratory Manual*, by Ping Hsu; [Rev. Fall 2018], available on Canvas.

## Course Requirements and Assignments

This is a practical, hands-on class. Attendance in the scheduled section is mandatory. A well-prepared student should be able to finish the experiments during the formal lab period. Students may use the lab during other EE97 section meeting times (on space available basis) to complete his/her work.

No eating or drinking is allowed in the lab.

Students are expected to leave the lab station neat, with the equipment turned off.

Neatness includes: scope probes and leads must be left coiled on the top of the lab bench (to avoid being stepped on); and, no paper, components, wire, or insulation from stripped wire is to be left on top of the bench or on the floor near your work area.

Each student is required to write a laboratory report for each lab as discussed in the introductory section of the Laboratory Manual and Appendix A. Reports are due in class on the dates indicated in the course schedule (last page) at the **beginning** of the class. No late reports will be accepted.

## Assignments and Grading Policy

### Exams

There will be one midterm and one final exam. These exams may be written exams, bench exams, or a combination of both. For a written exam, questions would pertain to the use of lab equipment, to components used, and to experiments performed. For a bench exam, each student will be asked to build circuits, to take measurements, and to discuss the results.

### Grading

Lab reports	40%
Prelab assignments	10%
Midterms	20%
Final Exam	30%

**Note:** No late lab report accepted.

Letter grades will be assigned starting from

100% - 90%	A+, A, A-
89.9%-80%	B+, B, B-
79.9%-70%	C+, C, C-
69.9%-60%	D+, D, D-
59.9%-0%	F

These are minimum grades. The instructor may assign a higher grade if, in the instructor's judgment, the work deserves a higher grade than the raw score indicates.

## University Policies

The link below contains university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. Please note the sections on academic integrity, consent for recording class and public sharing of instructional material, student technology resources, SJSU Peer Connections, SJSU Writing Center, and SJSU Counseling and Psychological Services (which offers workshops on taking exams among others).

[Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

## Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University's Academic Integrity policy](http://www.sjsu.edu/senate/docs/S15-7.pdf), located at <http://www.sjsu.edu/senate/docs/S15-7.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](http://www.sjsu.edu/studentconduct/) is available at <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.

Plagiarism includes copying *any portion* of your lab report from textbooks, lab notes, previous years' lab reports, or the reports of other students. Plagiarism also includes copying data. Any figures used from textbooks or the lab manual must be properly cited. Homework assignments that you turn in must have been worked out entirely by you. You can study with friends and work out the problem together, but you must then independently work it through and record your own work. *Students who provide their homework or labs to other students such that they can be copied are also committing a breach of academic honesty. This includes leaving your work on shared computers, leaving your flash drive where others can copy it, etc.* If you wish to help other students learn the material, studying together is acceptable as long as each individual goes on to produce their own independent work.

For more information about avoiding plagiarism in written reports, see: <http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>.

Review of the tutorial on plagiarism at <http://tutorials.sjlibrary.org/tutorial/plagiarism/index.htm> is recommended.

## **EE Department Honor Code**

*The Electrical Engineering Department will enforce the following Honor Code that must be read and accepted by all students.*

*“I have read the Honor Code and agree with its provisions. My continued enrollment in this course constitutes full acceptance of this code. I will NOT:*

- *Take an exam in place of someone else, or have someone take an exam in my place*
- *Give information or receive information from another person during an exam*
- *Use more reference material during an exam than is allowed by the instructor*
- *Obtain a copy of an exam prior to the time it is given*
- *Alter an exam after it has been graded and then return it to the instructor for re-grading*
- *Leave the exam room without returning the exam to the instructor.”*

### ***Measures Dealing with Occurrences of Cheating***

- *Department policy mandates that the student or students involved in cheating will receive an “F” on that evaluation instrument (paper, exam, project, homework, etc.) and will be reported to the Department and the University.*
- *A student’s second offense in any course will result in a Department recommendation of suspension from the University.*

## EE 97 / Introductory Electrical Engineering Laboratory, Fall 2018, Course Schedule

*Schedule is subjected to change with fair notice by announcement in lab.*

**Table 1 Course Schedule**

<b>Week</b>	<b>Date</b>	<b>Topics, Readings, Assignments, Deadlines</b>
1	8/20	Lab 1 Characteristics of a Practical DC Source
2	8/27	Lab 2 Current vs. Voltage Graph
3	9/3	Lab 2 Current vs. Voltage Graph (continued)
4	9/10	Lab 3 Light Controlled Switch
5	9/17	Lab 4 Oscilloscope and Function Generator
6	9/24	Lab 4 Oscilloscope and Function Generator (continued)
7	10/1	Lab 5 Rectifier and Voltage Regulator (Exp. #1& #2 only)
8	10/8	<b>Midterm exam</b>
9	10/15	Lab 6 Frequency Response
	10/22	<b>Spring Recess</b>
10	10/29	Lab 6 Frequency Response (continued)
11	11/05	Lab 7 Time Constant, Oscillator and Counter (omit Exp. #3)
12	11/12	Lab 8 Operational Amplifiers
13	11/19	Lab 8 (continued) AM Receiver
14	11/26	<b>FINAL EXAM</b> (in ENG 249) *

\* The final exam will be given in the last class of the semester.

## **Guidelines for the Format of an EE-97 Lab Report**

- 1) The first page is to be a title page with the following information provided in top right quadrant of the page in the given order.
  - a) EE 97 (Fall/Spring) 20xx.
  - b) Meeting day of the week; starting time of lab.
  - c) Lab # and title.
  - d) Student's name.
  - e) Partner: partner's name.
  - f) Station #.
  - g) Date of submission.
- 2) Report may be generated in a word processor. Hand sketched diagrams are ok.
- 3) Paper size should be 8 ½ inch x 11 inch.
- 4) Number and initial the pages in the top right-hand corner starting with the first page of the text being page 1.

## **Guidelines for the Content of an EE-97 Lab Report**

Each lab contains several experiments.

Each of the experiments should be reported separately so that it may be read by itself without reference to the other experiments. An exception is the first two experiments in Lab #1 which may be reported together. The detailed list of instrument model and serial numbers need not be repeated in every experiment unless there's a change in instruments between experiments.

Each experiment report should (as appropriate or required) contain:

- a. A statement summarizing the experiment.
- b. A complete labeled circuit diagram.
- c. A summary of the recorded data.  
This will usually be in a table.
- d. A completely annotated chart/graph of the results.  
(It is strongly recommended that charts and graphs be generated by hand.)
- e. A summary discussion of the recorded data/results including answers to questions asked in the experiment.
- f. Conclusions reached.  
(Discussion and conclusions in EE 97 may be combined in a single section.)

There should be a brief overall summary of the lab at the end of the report.