

San Jose State University
Aviation and Technology Department
Tech 060 (Sec 02): Introduction to Electronics, Spring 2018

Instructor:	Fariah Mahzabeen
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Office Hours:	Monday 3 – 4 pm
Class Days/Time/Location	Lecture: Monday 3 – 4.45pm, IS 133 Labs: Wednesday 12:00 pm-2:45 pm, IS 117
Prerequisites:	Math 71 or 30 or 30P or equivalent

Course Format

The course relies on lecture and lab materials presented in class and students are strongly encouraged to attend.

Course Description

Emphasizes on practical electronics applications and products. DC and AC theory; Ohm's Law, Kirchhoff's Laws, Power Laws, Network theorems, Schematic diagrams, instrumentation and measurement, and functions of discrete components.

Course Objectives

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

- Develop an understanding and working knowledge of the fundamentals of DC and AC theory and theorems.
- Define current, voltage, and Kirchhoff's current and voltage laws.
- Use voltage and current to calculate power dissipated by devices in a circuit.
- Use Ohm's law to determine voltage and current relationship in linear devices.
- Analyze series, parallel, series-parallel, and network circuits

- Apply the principle of superposition, Thevenin's equivalent circuits, and Norton's equivalent circuits.
- Analyze circuits containing independent current and voltage sources.
- Describe the properties of inductors, capacitors and obtain transient responses of circuits containing these elements.
- Identify the amplitude, frequency, and phase of a sinusoidal function.
- Transform sinusoidal current and voltage signals from time domain to frequency domain.
- Use the phasor concept to obtain solution of first and second order transient and steady state circuits.
- Use laboratory tools such as oscilloscopes, multimeters, function generators, and power supplies.
- Assemble a circuit and perform voltage and current measurements.
- Perform a critical evaluation of the differences between analytical solutions and the experimental measurements.

Textbooks

Floyd, Thomas L. (2013). Principles of Electric Circuits. (9th Edition). Upper Saddle River, New Jersey: Prentice-Hall.

Required lab kit

Every student must have the following items:

Multimeter

Breadboard with jumper wires

Alligator clips

9 volts battery with a battery connector

Recommended Link for buying Lab Kit:

You could buy the above items from anywhere. However, keep in mind that some purchases from overseas, especially China, takes more than a month. You must have your kit and the multimeter by the end of the first week. This is your investment that you would be using for the rest of your academic years and beyond at our department. You may also want to consider a component case carry box, which is absolutely optional.

Final Examination

The final exam will be comprehensive, covering all material presented in class.

Course Evaluation

The total points earned on all the midterms, quizzes, assignments, lab assignments, project, and final exam will be divided by the total possible points and the resulting percentage will determine the course grade.

Midterms 30%
Final exam 30%
Quizzes 10%
Homework Assignments 10%
Lab Experiments 20%
Lab Project 10%

The final grade will be determined according to the following scale on a curve:

A+ 97 -100%	B+ 87 - 89%	C+ 77 - 79%	D+ 66 - 69%
A 93 - 96%	B 83 - 86%	C 73 - 76%	D 60 - 65%
A- 90 - 92%	B- 80 - 82%	C- 70 - 72%	F 0 - 59%

I. Midterms & Quizzes

There will be two midterms given during mid-semester.

Final Comprehensive Exam will be given during final exam period. No makeup will be allowed. Students are encouraged to build an engineering notebook/formula sheet as the course develops and to include useful items such as the resistor color code, formulas, and wire tables.

There will be several quizzes given during the semester as deemed necessary, one quiz will be dropped. No makeup will be allowed. Beware, attendance is required at the start of lab sessions although students may be excused when the lab work is complete. Quiz topics are listed as follows:

II. Homework Assignments

Homework will be assigned during class hours and can be given from textbooks or from class discussions. The assignments for homework will be posted on Canvas as will all class presentations

III. Lab Experiments

You are expected to conduct a number of lab experiments which includes analyzing circuit both on breadboard and multisim. It is your responsibility to do a conscious and thorough job in a professional manner.

IV. **Final Exam** : Check Registrar's schedule

Academic Integrity:

Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the university's Academic Integrity Policy 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 policy on academic integrity can be found at http://sa.sjsu.edu/student_conduct.

Cell phones, text messaging, e-mail and Internet:

1. As a courtesy to the students and the instructor, all cell phones must be turned off during class and lab sessions.
2. The use of computers/tech products is restricted to the tasks assigned in class. Calculators will be allowed in class and on all exams. A student's personal formula sheet may be used and may include anything from the class. Class notes from the instructor will be provided on CANVAS after or at the same time as lectures. It is not anticipated that students in a technical course will attempt/need to use a keyboard during class lecture, however if this changes the instructor will allow provisions for this in class. The presence of computers and or tech products such as smart phones, watches and the like are not allowed during quizzes, midterms or the final exam. The appearance of these items during quizzes or exams will be considered a violation of the school academic integrity program.
3. Students who disrupt the class and do not stop when requested by the instructor will be referred to the SJSU Office of Student Conduct and Ethical Development.
4. Finally, note that test material will be over items presented in class, from instructor hand-outs, and from past exams and homework assignments. Thus, problems from the textbook are fair game but obscure material that is skipped is not.

Americans with Disabilities Act:

If you need course adaptations or accommodations because of a disability, or if you need 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 DRC to establish a record of their disability.

Course Outline

<u>Week</u>	<u>Date</u>	<u>Lecture</u>	<u>Lecture Topics</u>	<u>Lab</u>
1	Jan 24th			Intro, course and lab outline
1	Jan 29th	Intro and Chapter 1	Orientation, Units, Notation, Current, Voltage, and resistance	Purchase starts on lab kit, Multisim Introduction
2	Feb 5 th	Ch 2,3	Ohm's law, Energy and Power	Use of Multimeter, breadboard, resistor
3	Feb 12 th	Ch 4,5	Series circuits, Parallel circuits	Series circuit
4	Feb 19 th	Ch 6,7		Parallel Circuit
5	Feb 26 th	Midterm Review	Ch 1-7	Superposition
6	Mar 5th	Midterm 1	Ch 1-7	Lab Midterm
7	Mar 12th	Chap 8	Superposition, Thevenin, Norton Theorem	Thevenin Circuit
8	Mar 19th	Chap 9	Loop, mesh and node methods	Wheatstone Circuit
9	Mar 26 th	Spring Recess	Spring Recess	Spring Recess
10	Apr 2	Midterm 2 Review	Chap 8,9 review	Project Intro
11	Apr 9th	Midterm 2	Chap 8,9	Project Begin
12	Apr 16th	Chap 11	Alternating Circuits	Oscilloscope and AC exp
13	Apr 23	Chap 12	Capacitor	Capacitor
14	Apr 30	Chap 13	Inductors	Inductors
15	May 7th	Final Review	Chap 1-8	Project Final
16	May 19 th	Final Review	Chap 9,11,12,13	Project Presentation
17	May 23 rd			Troubleshooting