San José State University  
College of Engineering, Electrical Engineering Program  
EE98H Introduction to Circuit Analysis Honors  
Spring 2018, Section 1

Course and Contact Information

Instructor: Ping Hsu  
Office Location: ENG257  
Telephone: (408) 924-3902  
Email: ping.hsu@sjsu.edu  
Office Hours: Thursday 4pm to 5pm  
Class Days/Time: Tuesday and Thursday, 10:30-11:45  
Classroom: ENG341  
Units: 3

Course Description
A project and design based approach to the introduction of circuit laws and analysis methods such as nodal analysis, superposition, equivalent circuits and phasor analysis for circuits involving RLC and operational amplifiers.

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

- Determine voltages and currents in a DC circuit consisting of resistors, current sources, voltage sources, and dependent sources.
- Determine Thevenin and Norton equivalent circuit of a DC circuit and find the maximum power output of a DC circuit.
- Determine the DC gain and operating point of an OP amp circuit.
- Determine the transient response of a first and second order circuit consisting of RLC.
- Determine the sinusoidal steady state response of a circuit consisting of RLC.
- Determine the power delivered and absorbed by an element in a RLC circuit.
Required Texts/Readings


Lecture note will be posted on the Canvas.

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

The course will follow the selected subjects as listed on the course description. Additional theory and examples will be given and discussed in class as time permits. Please note that lecture materials are NOT solely based on the required text/notes and students are responsible for following up the lecture in order to prepare themselves for the exams.

- Students are responsible for the reading the materials, handouts, lecture presentations, etc.
- Students are responsible for following up and keeping track of the in-class lecture materials.
- Students are responsible to practice critical thinking

Grading Policy

The following weighting will be used in calculating the overall course grades.

<table>
<thead>
<tr>
<th>Item</th>
<th>% Grade</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm (2)</td>
<td>30%</td>
</tr>
<tr>
<td>Class Projects (2~3)</td>
<td>20%</td>
</tr>
<tr>
<td>Final</td>
<td>30%</td>
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Homework will be assigned weekly or bi-weekly. Students are encouraged to discuss homework problem but copying is considered cheating. The lowest homework grade will not be included in the calculation of the overall course grade.

There will be two midterm exams and one final exam. The midterm exam dates on the course schedule are for reference only. The actual exam date will be announced in advance. All exams will be closed-book and a calculator and one 8.5"x11" sheet of notes (2 sides, in your original handwriting -- not a photocopy) is allowed. A photographic ID will be required. Unless there is a documented, serious explanation for missing an exam, make-up exams will not be allowed.
Classroom Protocol

EE98H students understand that professional attitude is necessary to maintain a comfortable academic environment in the classroom. For examples:

- Students will put their cell phones in quiet/vibration mode during the lecture.
- Students understand that drinking water, juices, etc. during the lecture is acceptable but NOT eating.
- Students will not skip the lecture and then ask the instructor to summarize the lecture later on. Office hours are for students who have specific questions, not for the instructor to summarize the lecture for any specific student.
- Students will come to the class on time and leave the class at the end of the lecture.
- Students will consult the course syllabus for class policies and requirements before requesting the instructor for any special considerations and/or exceptions.
- To minimize possible tension during the exams, students are requested to follow the exam rules closely.
- Students will work on the projects on their own and will not share the work with other students/teams.
- Students understand that long-term learning is their responsibility and will always keep up.

Students who disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University.

University Policies

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. To learn important campus information, view University Policy S90–5 at http://www.sjsu.edu/senate/docs/S90-5.pdf and SJSU current semester’s Policies and Procedures, at http://info.sjsu.edu/static/catalog/policies.html. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not address the issue, it is recommended that the student contact the Department Chair as the next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.
Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor’s permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
  - It is suggested that the greensheet include the instructor’s process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
  - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/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/.

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 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.
## Course Schedule

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<tr>
<th>Week</th>
<th>Topics</th>
<th>Applications/Projects</th>
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| 1    | Review DC circuit theory from Physic 51.
Chapter 2: Ohm's Law, Kirchhoff's Laws
Series resistors and voltage division
Parallel Resistor and current division | Potentiometer based position sensor, strain gauge sensor, thermistor based temperature sensor, and the associated supporting circuit design, |
| 2    | Chapter 3: Nodal analysis, Mesh analysis, dependent source | |
| 3    | Chapter 4, Linearity, Super position, Source transformation | Transistor circuit analysis (dependent source). |
| 4    | Chapter 4: Thevenin theorem, Norton theorem. Maximum power transfer | |
| 5    | Chapter 5: Operational Amplifiers | Design a level-shift amplifier, a strain gauge amplifier and an ECG signal amplifier (Project I) |
| 6    | Chapter 5: Operational Amplifiers | |
| 7    | Chapter 5: Operational Amplifiers | |
| 8    | Chapter 6: Capacitors and inductor | Rectifier circuit capacitor sizing, LM555 Timer circuits, Maximum clock rate vs. logic gate capacitance (fan-in, fan-out). |
| 9    | Chapter 7: RC and RL circuit | |
| 10   | Chapter 8: RLC circuit | AM receiver turning circuit analysis Wireless charging resonate circuit analysis |
| 11   | Chapter 9: Phasor, Impedance, admittance | Speaker system cross-over network analysis. Active filter design (Project 2) |
| 12   | Chapter 9: Phasor, Impedance, admittance | |
| 13   | Chapter 11: AC power. | The importance of power factor in power systems. |
| 14   | Chapter 11: AC power. | |