

Santa Clara University  
Department of Electrical Engineering  
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Winter 2024

ECEN 100: Electric Circuits II  
TEXT: James Nilsson and Susan Riedel, *Electric Circuits* (11th edition), Pearson, 2018.

## SYLLABUS

WEEK	TOPICS	CHAPTER
1	Circuit analysis using phasors (review) (Modules 1 – 3)	9, 10
2	Power calculations and RMS values (Modules 4 – 6)	9, 10
3	Op-amps and phasors Frequency selective circuits (Modules 7 – 9)	14, 15
4	Transfer functions Bode plots (Modules 10 – 13) <b>Note:</b> Modules 11 and 12 provide an overview of Project 1	14, Appendix E
5	Mutual inductance (Modules 15 – 16) <b>MIDTERM 1</b>	6
6	Mutual inductance (ctd.) (Modules 15 – 16) Linear and ideal transformers (Modules 17 – 18)	6  9
7	Linear and ideal transformers (ctd.) (Modules 17 – 18) Fourier series (Module 14)	9  16

8	Fund. of Laplace transforms (Module 21) <b>MIDTERM 2</b>	12
9	s-domain circuit analysis (Modules 22 – 24) <b>Note:</b> Module 23 provides an overview of Project 2	13
10	s-domain circuit analysis (ctd.) (Modules 25 – 26)	13

### **LEARNING OUTCOMES**

Students who successfully complete this course should be able to:

1. Apply the principle of active power maximization to circuits with variable load impedances.
2. Use transfer functions and Bode plots to analyze frequency selective circuits.
3. Use Laplace transforms to analyze the transient and steady-state behavior of linear circuits.
4. Explain the relationship between phasor analysis and Laplace transforms in circuits with sinusoidal sources.
5. Use Matlab and SPICE to design frequency selective circuits, and circuits with prescribed transient behavior.

### **GRADING**

The course grade will be based on three criteria – homework, midterms and the final exam. This grade is worth 4 units, and will be calculated in the following way:

Homework: 10%  
Midterm 1: 25%  
Midterm 2: 25%  
Final Exam: 40%

### **LABS**

The lab component of this course consists of two projects, and is worth 1 unit. The projects *will be graded separately* from the rest of the course work, and each one will be worth 50% of the lab grade.

Project 1 begins in week 4, and must be completed in two weeks. The design is demonstrated in the laboratory in week 6.

Project 2 begins in week 8, and must be completed in two weeks. The design is demonstrated in the laboratory in week 10.

The work should be done by teams of two students. Each team should submit a *single* project report.

### **GENERAL INFORMATION**

OFFICE: SCDI 4025 – O  
OFFICE HOURS: Tuesdays and Thursdays, 4:00-5:00, and by appointment.  
PHONE: (408) 554-2394  
E-MAIL: [azecevic@scu.edu](mailto:azecevic@scu.edu)  
WEBSITE: <http://www.engr.scu.edu/~azecevic/>

### **Academic Integrity**

The Academic Integrity pledge is an expression of the University's commitment to fostering an understanding of—and commitment to—a culture of integrity at Santa Clara University. The Academic Integrity pledge, which applies to all students, states:

I am committed to being a person of integrity. I pledge, as a member of the Santa Clara University community, to abide by and uphold the standards of academic integrity contained in the Student Conduct Code.

Academic integrity is part of your intellectual, ethical, and professional development. I expect you to uphold the principles of this pledge for all work in this class. I will clarify expectations on academic integrity -- including the use of AI tools such as ChatGPT and course sharing sites for all assignments and exams in this course. If you have questions about what is appropriate on any assignment, please let me know before you hand in work. For more resources about ensuring academic integrity in your work, see:

<https://libguides.scu.edu/academic-integrity>

### **Discrimination, Harassment and Sexual Misconduct (Title IX)**

Santa Clara University is committed to providing all students with a safe learning environment free of all forms of discrimination, sexual harassment, and sexual violence.

Please know that as a faculty member, California law SB 493 requires me to report any information brought to my attention about incidents of sexual harassment or misconduct to the SCU Equal Opportunity and Title IX Office ((408) 551-3043). This includes, but is not limited to, disclosures in writing assignments, class discussions, and one-on-one conversations.

Should you need support, SCU has dedicated staff trained to assist you in navigating campus resources, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and filing a formal complaint with the University or with law enforcement. Please see the Student Resources page for more information about reporting options and resources.

If you or someone you know has experienced sexual harassment or sexual violence and wishes to speak to a confidential resource who is not required to report, please contact one of the following SCU resources for support:

- SCU Wellness Center
- CAPS
- Any individual (clergy, counselors) acting in a professional capacity for which confidentiality is mandated by law

I am happy to help connect you with any of these resources.

### **Accommodations for Pregnant and Parenting Students**

Santa Clara University does not discriminate against any student on the basis of pregnancy or related medical conditions. Absences due to medical conditions relating to pregnancy and childbirth will be excused for as long as deemed medically necessary by a student's doctor, and students will be given the opportunity to make up missed work. Students needing accommodations can often arrange accommodations by working directly with their instructors, supervisors, or departments. Students needing accommodations can also seek assistance with accommodations from the Office of Accessible Education (OAE) or from the Office of Equal Opportunity and Title IX Office. This resource page from Title IX provides information for students and faculty regarding pregnancy rights.

### **Office of Accessible Education**

If you have a documented disability for which accommodations may be required in this class, please contact the Office of Accessible Education ([oea@scu.edu](mailto:oea@scu.edu), <http://www.scu.edu/oea>) as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through OAE, please be sure to request your accommodations through your myOAE

portal and discuss them with me during my office hours within the first two weeks of class.

To ensure fairness and consistency, individual faculty members are required to receive verification from the Office of Accessible Education before providing accommodations. OAE will work with students and faculty to arrange proctored exams for students whose accommodations include double time for exams and/or assistive technology. Students with approved accommodations of time-and-a-half should talk with me as soon as possible. The Office of Accessible Education must be contacted in advance (at least two weeks notice recommended) to schedule proctored examinations or to arrange other accommodations.

In light of shifting health advisories related to COVID-19, exams may be administered online. Students with approved testing accommodations should contact me (at least two weeks notice recommended) prior to an exam date to notify me of their intent to use their testing accommodations on the upcoming exam to ensure their accommodations are effectively implemented.

### **Safety Measures**

In order to meet our learning objectives, we will adhere to the highest standards for safety and mutual respect. I expect everyone to adhere to current university mask mandates at all times; to make their best attempt to make themselves heard when asking questions or contributing to discussions; and refrain from eating or drinking in class. It is expected that everyone will follow university guidelines about health and public safety measures outlined on the Prepared SCU website.

### **Use of Classroom Recordings**

All online class meetings will be recorded and made available on Camino. As is stated in the Student Conduct Code: “...Dissemination or sharing of any classroom recording without the permission of the instructor would be considered “misuse” and, therefore, prohibited. Violations of these policies may result in disciplinary action by the University. At the instructor’s discretion, violations may also have an adverse effect on the student’s grade.”

### **Copyright Statement**

Materials in this course are protected by United States copyright laws. I am the copyright holder of the materials I create, including notes, handouts, slides, and videos. You may make copies of course materials for your own use and you may share the materials with other students enrolled in this course. You may not publicly distribute the course materials without my written permission.

## **Technology Support**

SCU can provide you with technology assistance, and you can also reach out to our providers directly for questions. For Camino (SCU's branded instance of Canvas) support, contact [caminosupport@scu.edu](mailto:caminosupport@scu.edu) or call 408-551-3572. You can also use the help button within the Camino platform (on the left hand navigation) for 24/7 support via chat or phone with our vendor.

For Zoom assistance, contact Media Services at [mediaservices@scu.edu](mailto:mediaservices@scu.edu) or 408-554-4520. You can also get support from the Zoom Help Center website.

For SCU network and computing support, contact the SCU Technology Help Desk at [techdesk@scu.edu](mailto:techdesk@scu.edu) or 408-554-5700. They can provide support for MySCU Portal, Duo, eCampus, hardware and software issues, and more.

## **Syllabus Statements on Diversity, Inclusion, and Wellness**

Santa Clara University syllabi are encouraged to include information for students to promote a more inclusive classroom. Below are recommended examples of syllabi statements that faculty may use. For more on developing an inclusive syllabus and course design see a campus resource on Inclusive Teaching and a toolkit from the Association of College and University Educators (ACUE).

## **Land Acknowledgment**

Santa Clara University occupies the unceded ancestral homeland of the Ohlone and Muwekma Ohlone people.

## **Respect for Diversity**

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diverse identities (e.g., those based on gender, sexuality, disability, age, socioeconomic status, ethnicity, race, religion, and culture). Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

## **Gender Inclusive Language**

This course affirms people of all gender expressions and gender identities. If you go by a name different from what is on the class roster, please let me know. Using correct gender pronouns is important to me, so I encourage you to share your pronouns with me and correct me if I make a mistake. If you have any questions or concerns, please do not hesitate to contact me. For more on personal pronouns see [www.mypronouns.org](http://www.mypronouns.org).

## **Wellness Statement and Mental Health Resources**

I know you will do the best you can in this class (and all of your classes); however, it should never be at the expense of your own mental health, physical health, and/or well-being. Jesuit education is grounded in cura personalis, concern for the whole person—mind, body, and spirit. What does this mean for you? Be kind to others, and more importantly, be kind to yourself. Attend to your sleep (quantity and quality); drink lots of water; move; get outside; and pay attention to beauty that isn't coming to you on a screen. Eat good food; laugh; enjoy friends and family; look for opportunities to connect with others in new ways; pray, meditate, or otherwise attend to your spirit. And ask for help, even if you don't think you need it. Lots of folks, including me, are here to support you. It's never too late to reach out, and I am committed to helping you.

SCU has many resources and programs to support you. These resources may be especially helpful:

Wellness Center: <https://www.scu.edu/wellness/>

The Wellness center provides resources to aid and promote student well-being across the eight dimensions of wellness, including student peer groups for healthful living, violence prevention, and recovery.

CAPS: <https://www.scu.edu/cowell/counseling-and-psychological-services-caps/>

Santa Clara students are provided confidential counseling sessions at no cost through Counseling and Psychological Services (CAPS). Students have access to clinically appropriate, short-term therapy; group therapy; and other resources for care. A new 24/7 support line is also available: 408-554-5220.

SCU Culture of Care: <https://www.scu.edu/osl/culture-of-care/>

If you are concerned for the mental or physical welfare of one of your peers, the Office of Student Life Culture of Care website provides resources for recognizing and helping someone in distress.

**Academic Concerns**

If you are concerned with your progress in this class, please contact me so that we can find solutions together. Drahmman Center can also offer support with issues regarding your academic progress more broadly.