California State University at Sacramento
ENGINEERING - ELECTRICAL AND ELECTRONIC
Fall 2021
ENGR 17 – **Introductory Circuit Analysis**

Instructor: Zahra Najafi, PhD
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Office Hours: Monday 9:30 AM – 10:30 AM and by appointments (links available in Canvas)

Course Content: Writing of mesh and node equations. DC and transient circuit analysis by linear differential equation techniques. Application of laws and theorems of Kirchhoff, Ohm, Thévenin, Norton and maximum power transfer. Sinusoidal analysis using phasors, average power.

Prerequisite: Phys 11C and Math 45; either the math or physics may be taken concurrently, but not both.

Required Textbook: ***Electric Circuits***, Nilsson and Riedel, 11th Edition, 2019, Prentice Hall, ISBN: 978-0134746968

Acknowledgements: The course material for this course have been created by Professor Russ Tatro. I thank him for sharing the material.

Grading:	Midterm I	15%
	Midterm II	15%
	Final Exam	20%
	Homework	30%
	Quizzes	20%

Course Goals: Introduce the fundamental tools of linear circuit analysis which is useful to all engineers. Develop the fundamentals of circuits, including wires, resistors, capacitors, inductors, voltage and current sources, and operational amplifiers. Prepare students for more advanced courses in electronic applications and circuit analysis.

Online Course: This course will be offered in fully online format. The class times will be dedicated to learning materials at your own pace. The online material may include pre-recorded videos, online quizzes, outside class reading assignments and other online sessions. All course materials will be available on the Moodle.

Students will be able to:
1. Identify linear systems and represent those systems in schematic form.
2. Apply Ohm's Law and Kirchhoff's current/voltage laws to circuit problems.
3. Simplify circuits using series and parallel equivalents. Simplify circuits to their Thévenin and Norton equivalents.
4. Perform node and loop analyses and state the system of linear equations in standard matrix form. 5. Apply the concepts of energy and power to solving circuit problems.
6. Identify and model first order electric systems involving capacitors and inductors.
7. Perform circuit analysis by the steady-state phasor method of time-varying signals(phasors).

Homework: Homework assignments will be completed online using Moodle activities in the course Moodle site. Each chapter will have at least one homework assignment. Problems shall either be from the textbook or created by the instructor. All homework material is testable whether covered in class or only in the homework assignment. There is no time limit on completing the homework assignment as long as you complete the homework by the deadline. You can "submit" the homework as many times as you wish until you get a perfect 100% on the assignment. You will receive the exact same questions on every attempt on the homework so there is no reason not to attempt a less-than perfect homework score again and again.

Quizzes: There will be a 60 minute quiz each week (except for exam weeks). The quizzes are self-paced online between the hours of 12 am and midnight each Wednesday in the ECS Moodle Quiz activity. The quiz must be completed in one session (no starting nor stopping with a break) in timed one continuous hour. The quizzes are "once and done" with only one submission allowed.

Exams: There will be two 120 minute midterm exams and a three hour final exam during the semester. The exams are a timed test completed online using a Moodle Quiz module as scheduled in the syllabus. The student will use the online access of their choice and should make appropriate arrangements to take the exam online during the scheduled day/time. The exams are "once and done" with only one submission allowed.

Prior written permission is required for all make-up exams and then only with compelling reasons in accordance with and as outlined by University policy.

Grading Policy: The course will be graded in accordance with University guidelines using the "+" and "-" method as called for by the University. Typical (meaning somewhere around this region) grades ranges are: "A" 94.5 and above "A-" 89.5 to 94.49 "B+" 87.5 to 89.49 "B" 83.5 to 87.49 "B-" 79.5 to 83.49 "C+" 77.5 to 79.49 "C" 73.5 to 77.49 "C-" 69.5 to 73.49 "D+" 67.5 to 69.49 "D" 63.5 to 67.49 "D-" 59.5 to 63.49 "F " Below 59.5

Moodle Course sign-up :
1. Login to GlobalProtect VPN.
https://www.ecs.csus.edu/news/articles/vpn.html .
2. Your Sac State email will be the contact method for the course.
3. Log onto Moodle:
https://ecs-pw-moodle.ecs.csus.edu/course/view.php?id=80
4. Enroll into the Engr 17 course by entering the section appropriate code: Go to "ENGR 17-2021 Fall-Najafi" Use the code: E17Fall

Moodle Tips and Hints
1. You can "Submit" the homework as many times as you wish. You will NOT be able to see any assignment you did not complete (by submitting the assignment).
2. All quizzes are ONE submission only. During the quiz you will be able to "check" your answer. Wrong answers will receive a penalty of about 33% and you will be allowed up to three tries for each part of a problem. The computer will automatically submit your quiz at the end of the 60 minutes allowed for the quiz.
3. All exams are ONE submission only. During the exam you will be able to "check" your answer. Wrong answers will receive a penalty of about 33% and you will be allowed up to three tries for each part of a problem. The computer will automatically submit your exam at the end of the 60 minutes allowed for the exam. You must quickly send me your original work for my review if you feel a question was scored incorrectly or incompletely.
4. Periodically review your grade in the Moodle Gradebook. Let me know of any problem or anomaly as soon as possible
Entering questions answers into Moodle:
In most cases, you will be entering a number into Moodle as the answer to a calculation. The following table shows you acceptable and not acceptable forms of an answer.

Intended Answer	Acceptable alternatives	Non-Acceptable
0.5	.5, 0.5, 0.500, 5e-1, 5E-1	1/2, 50%, 10/20, 20/40, ….
10,000	10000, 10E3, 10e3	10,000 (no comma allowed)
-40	-40, -40.00, -4E1, -4e1	
π (pi)	3.14159 (as many digits as you care to use)	pi
Algebraic symbols	I will not ask you to enter equations symbolically into Moodle.	Do not enter common math symbols such as +, -, X, /, ln, e, and so on as an equation. 2+2 is not acceptable, enter "4" 2-2 is not acceptable, enter "0" And so on.

Engr 17 – Tentative Course Outline – Fall 2021

Week	Date	Chapter	Topics:
1	08-30 09-01 09-03	1.1 – 1.4 1.5 – 1.6	Course Introduction –SI Units, Voltage and Current Passive Sign Convention, Power and Energy
2	09-06 09-08 09-10	2.1 – 2.2 2.4 – 2.5	Circuit Elements – R, L and C, Electrical Resistance Kirchhoff's Laws – KCL and KVL, Circuits with Dependent Sources
3	09-13 09-15 09-17	3.1 – 3.2 3.3 – 3.4	Resistors in Series and Parallel Voltage and Current Division
4	09-20 09-22 09-24	Hand 0ut 4.1 – 4.2	Using Matlab to solve linear equations Nodal Analysis
5	09-27 09-29 10-01	4.3 – 4.4 **Exam 1**	Node analysis with dependent sources, Special Cases **Chapters 1, 2, 3**
6	10-04 10-06 10-08	4.5 4.6 – 4.7	Mesh Analysis Mesh analysis with dependent sources, Special Cases
7	10-11 10-13 10-15	4.9 4.10 4.11 - 4.12	Equivalent Circuits - Source Transformations Thévenin and Norton Equivalent Circuits Test Voltage/Current Method and Max Power Transfer
8	10-18 10-20 10-22	5.1 5.2 – 5.6	The Ideal Operational Amplifier Analyzing the OpAmp
9	10-25 10-27 10-29	6.1 – 6.2 6.3	Inductor & Capacitor Series/Parallel Inductors and Capacitors
10	11/05	**Exam 2**	**Chapters 4, 5 and 6 (partial)**
11	11-08 11-10 11-12	9.1 – 9.3 9.4	Sinusoidal Source, the Sinusoidal Response, the Phasor The Phasor and Passive Circuit Elements
12	11-15 11-17 11-19	9.5, 9.7 – 9.9 6.4	Analysis of Circuit Elements in the Frequency Domain, Mutual Inductance
13	11-22 11-24 11-26	9.10 9.11	The Transformer The Ideal Transformer and Impedance Matching **Thanksgiving Holidays**
14	11-29 12-01 12-03	10.1 – 10.2 10.3	Instantaneous and Average Power rms Value
15	12-06 12-08 12-10		End of course wrap-up
16	12-15	**Final Exam**	**Final exam covers Chapters 6 (Mutual Inductance), 9 and 10**

Engr 17 – Quiz and homework Due Dates below may shift slightly – see the online schedule for latest deadlines. see the online schedule for latest deadlines (Color-coded by the exams (Purple), quizzes (Red), and HW(Blue))

Week	Date	Online Quiz	Date	Homework
1				
2	09-08	Q1 - Chapter 1	09-10	H01 - Chapter 1
3	09-15	Q2 - Chapter 2	09-17	H02 - Chapter 2
4	09-22	Q3 - Chapter 3	09-24	H03 - Chapter 2 and 3
5	**10-01**	**EXAM 1**	09-29	H04 - Chapter 3 and Matlab
6	10-06	Q4 – Chapter 4	10-08	H05 – Chapter 4
7	10-13	Q5 - Using Matlab	10-15	H06 - Chapter 4
8	10-20	Q6 - Chapter 4	10-22	H07 - Chapter 4
9	10-27	Q7 - Chapter 4	10-29	H08 - Chapter 5
10	**11/05**	**EXAM 2**	11/03	H09 – Chapter 6 (6.1 – 6.3)
11	11-10	Q8 - Chapter 5	11-12	H10 – Chapter 9
12	11-17	Q9 – Chapter 9	11-19	H11 - Chapter 9
13	11-24	Q10 - Chapter 9	11-24	H12 - Chapter 9
14	12-01	Q11 – Chapter 9		
15	12-08	Q12 – Chapter 10	12-08	H13 - Chapter 10
16	**12-15**	**FINAL EXAM**		

-Students with learning disabilities are welcome and will be accommodated according to evaluations and recommendations. Progress and achievement of students in this category will be evaluated through a variety of testing methods. Students must request special accommodations in writing by the end of the second week of class to be eligible for accommodations in this class.

Campus Support:

- If you have a disability and require accommodations, please contact me as soon as possible, and the SSWD office at located in Lassen Hall 1008, phone (916) 278-6955, (916) 278-7239 (TDD only) or via email at sswd@csus.edu.
- Student Health and Counseling Services staff are committed to continuing to provide exceptional service to our campus community. Though many students may be away from campus, most services are offered using secure remote technology.
- If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away! The CARES office provides case management support for any enrolled student. Email the CARES office at cares@csus.edu to speak with a case manager about the resources available to you. Check out the CARES website.

Health & Safety Information:

If you are sick, stay home and do not attend class. Notify your instructor. Please self-diagnose if you are experiencing any COVID- like symptoms (fever, cough, sore throat, muscle aches, loss of smell or taste, nausea, diarrhea, or headache) or have had exposure to someone who has tested positive for COVID contact Student Health & Counseling Services (SHCS) at 916-278-6461 to receive guidance and/or medical care. You are asked to report any possible COVID related illnesses/exposures to SHCS via this link COVID-19 Illness/Exposure Report Form. Expect a call from SHCS within 24 hours. The CDC provides a good source of information regarding COVID-19 and a way to self-check symptoms: https://www.cdc.gov/coronavirus/2019-ncov/index.html