University of Texas at El Paso
EE 2351 – Electric Circuits II
Fall 2021

Course Information

Meeting day and time:	MW, 4:30 pm – 5:50 pm
Room:	**PSYCH 308**
Final Exam:	Monday, December 6th, 4:00 pm – 6:45 pm
Course designation:	EE 2351 – 004
CRN:	17307
Credit hours:	3
Lecture hours:	3

Course Description: Analysis of transient behavior in first order and second order circuits. Circuit analysis using Laplace transforms. Network functions and frequency response representation of circuits. Frequency selective circuits and resonance. Steady-state analysis of circuits fed by non-sinusoidal periodic signals using Fourier series. Two-port networks. Computer-aided analysis of circuits.

Instructor Information

Jesus J. Gutierrez, Ph.D.
Assistant Professor

Office:	ENGR A-338
Office Hours:	MWF – 1:00 pm – 3:30 pm or by appointment (virtual also possible)
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Course Materials

- **Textbook (Main):**
  Electric Circuits, 11th Edition
  James W. Nilsson and Susan Riedel
  Pearson Education, Inc. 2018, 816 pages
  ISBN-10: 0-13-474696-1
  ISBN-13: 978-0-13-4746968
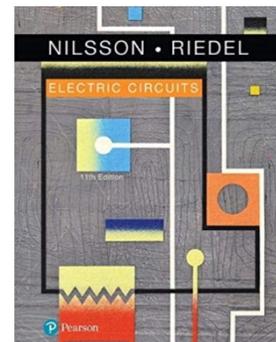- **Access to MasteringEngineering**
  Students should be able to access MasteringEngineering up to 1 year after initial subscription.
  >>>> Course ID: gutierrez35149 <<<<<<

- **Textbook (Optional):**
  Circuit Analysis and Design
  Fawwaz T. Ulaby, Michel M. Maharbiz, & Cynthia M. Furse
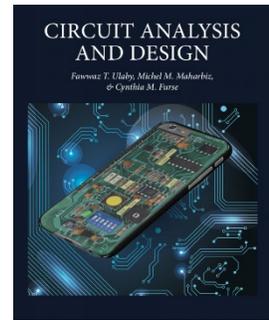 Michigan Publishing, 2018, 798 pages

ISBN (hardcopy): 978-1-60785-483-8
ISBN (electronic): 978-1-60785-484-5
Free PDF & Companion Website: http://cad.eecs.umich.edu

- **Zybook Interactive Textbook (Optional):**
    1. Sign in or create an account at: http://learn.zybooks.com
       (use your @miners e-mail address)
    2. Enter zyBook code: UTEP EE2351GutierrezFall2021
    3. Subscribe ($58 for the semester)

- Pen/pencil and paper/notebook for taking notes
- TI-84 scientific calculator or equivalent (no TI-89 or Nspire)
- Computer or laptop with access to the internet
- Access to Multisim and/or LTSpice

Some course content will be delivered through Blackboard. Also, important class announcements will be delivered via Blackboard and/or e-mail. Please make sure your UTEP e-mail is working, and you have stable access to the internet.

If a student has no computer with access to the internet, from UTEP's Technology Support Center has borrowing services for laptops and tablets: https://www.utep.edu/technologysupport/TSCenter/TSC_EQ_LaptopsTablets.html
UTEP's Technology Support center also helps for technological needs beyond your scope of troubleshooting, so make sure you contact them if you encounter technical difficulties.

Students should maintain a well-organized notebook that archives their syllabus, lecture notes, homework problems, and tests. Students are also encouraged to purchase a USB Drive or use a cloud service like Dropbox or OneDrive to save their digital work.

Corequisites

- EE 2151 – Lab for EE 2351

Prerequisites

By Course (with grade of "C" or better):
- EE 2350 – Circuits I
- PHYS 2421
- MATH 2326 – Differential Equations

By Topic:
- Knowledge of passive and active circuit components
- Algebra and calculus (integrals, derivatives, summations)
- Knowledge of circuit analysis techniques
- Complex numbers and phasors

CIRCUITS II

Course Outline

Topics covered in this course include:

1. First order and second order circuits, analysis, and responses.
2. Frequency response of circuits, passive and active filters, Bode plots.
3. Circuit Analysis by Laplace Transform, properties of Laplace transform, partial fraction expansion, s-domain circuit analysis
4. Fourier analysis technique, Fourier series representation, circuit applications, average power, Fourier transform, circuit analysis with Fourier transform.
5. Two-Port Circuits.

Course Outcomes

By the end of the semester, the student will demonstrate the ability to:
- Understand the behavior of various types of circuit configurations, such as first order RC and RL circuits, and second order RLC circuits.
- Learn and use computer tools to analyze and design circuits.
- Understand the frequency response of circuits and the various types of passive and active filters, and how to design filters that meet certain specifications.
- Perform circuit analysis in complex frequency domain using the Laplace transform.
- Apply Fourier series analysis techniques and its applications in circuits.
- Understand two-port networks and calculate current-voltage network parameters

Contribution to Professional Component
EE 2350 is a sophomore level core course that builds on topics covered primarily in freshman and sophomore lower division required courses.

Relationship to (ABET) Program Outcomes

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
  Students use mathematical and engineering concepts in the analysis and design of complex electrical circuits.

- An ability to apply engineering design to produce solutions that meet specified needs:
  Students use their newly acquired skills to design circuits that meet specified behaviors.

- Ability to communicate effectively with a range of audiences:
  Students solve circuit problems in teams and discuss circuits topics with their fellow classmates and the professor.

- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies:
  Students learn to use software to design and analyze circuits, which will then implement using real circuit components.

Rules and Policies

Grading

Student achievement in the course objectives will be assessed using a combination of in-class work, homework, quizzes, and exams. All student grades are protected by the Privacy Act of 1974.

Your course grade will be determined by your weighted performance in the following categories:

Homework ……….…………... 40%	$90\% - 100\%$	$\rightarrow$ **A**
Weekly Quizzes ……...…….. 30%	$80\% - 89\%$	$\rightarrow$ **B**
Midterm Exam …………..…… 15%	$70\% - 79\%$	$\rightarrow$ **C**
Final Exam ……………………. 15%	$60\% - 69\%$	$\rightarrow$ **D**
	$0\% - 59\%$	$\rightarrow$ **F**

For some students, there may be a "gray area" between two-letter grades in the final distribution, so two people getting the same weighted average grade could get different letter grades. If you are in one of these gray areas, whether you get a higher or lower grade depends primarily on two factors: (a) class participation and (b) whether your performance has been improving or declining over time.

Weekly Quizzes Policy

At the end of each Wednesday class, with some exceptions, there will be a small quiz covering the material from the previous week. The weekly quizzes will account for 30% of the final grade. The time allotted for the quiz will be no more than 15 minutes. No notes or other material is allowed other than calculator, pen/pencil, eraser. Formulas will be provided if needed. Your quiz should be your own work. Students suspected of cheating or copying quizzes will be submitted to the Office of Student Conduct and Conflict Resolution (OSCCR) and will be part of your permanent record at UTEP.

Homework Policy

- Homework is an integral part of the course. It is crucial that you promptly and effectively do all your homework on MasteringEngineering, as it will be very useful for your learning and preparing for the tests.
- There are 2 tries for each assignment, keeping your best score. The number of tries per question is 3, but some credit is lost for each incorrect answer. Bonus credit will be given for not opening hints (1%).
- Your homework must be your own work. Students suspected of cheating or copying homework will be submitted to the Office of Student Conduct and Conflict Resolution (OSCCR) and will be part of your permanent record at UTEP.

~ Missed Homework ~

- There will be a due date for each homework assignment. If for some reason you cannot finish the homework on the due date, the grade will be reduced proportionately to the days passed after the due date (10% off for each day passed).

CIRCUITS II

Exam Policy

- There will be one midterm and one final exam, each accounting for 15% of the grade.
- Duration of the midterm exam will be one hour and twenty minutes.
- Duration of the final exam will be two hours and forty-five minutes.
- You will only be allowed to have the materials that are required for the test (non-programmable calculator, pen or pencil, eraser, one cheat sheet of your own handwriting with your name and UTEP ID clearly legible on both sides of the paper).
- Full work must be shown for full credit. Work must be neat and well organized.
- The final answer must be boxed and given proper units.
- **Your exam should be your own work. Students suspected of cheating or copying will be submitted to the Office of Student Conduct and Conflict Resolution and will remain part of your permanent record at UTEP.**
- The tentative schedule for the exams is shown in the chart below, subject to change:

Date	Exam
Monday, October 18	Midterm
Monday, December 6	Final

~ Missed Exams ~

A missed exam can be made-up IF AND ONLY IF:

(1) the reason for missing the exam is beyond the student's control, e.g. such as a medical excuse, jury duty, death in the family or automobile accident, or

(2) prior consent is obtained from the professor for missing the exam based on a non-frivolous reason, e.g. such as a job interview, conference, or out-of-town job related travel. In either case, the student must submit a written and signed statement describing the reasons for missing the exam, with appropriate documentation, and petition for a makeup exam. Medical excuses require a note from the doctor. **A missed exam will carry zero grade if these conditions are not met.**

Attendance Policy

Students are required to attend class and to show up to lectures on time. The course instructor reserves the right to turn away late comers and to withdraw students from the course that are repeatedly absent. Students missing more than two lectures should seriously reflect on their commitment to this course, as missing classes is highly correlated with poor performance. Students absent from lecture are still held responsible for all information discussed, homework assigned, and exams administered during that missed lecture.

Class Etiquette

The following items are expected from you as part of being a student in the class:

• Ask questions! Despite how "silly" or "dumb" you may think your question is, it is very likely that other students have the same question. Confusion on even small details in course material can cause bigger problems and hold you back. If you are truly embarrassed by your question, send me an anonymous e-mail. I promise I will respond!

• Respond honestly to polls and provide real-time feedback to instructor about the course. This will contribute greatly to the quality of the course and your success in it.

• Visit the course instructor during office hours, or by appointment, if needed.

• Treat e-mail correspondence as a professional exchange of information.

• Turn off cell phones, pagers, or anything else that may distract the class.

• Take notes during class and read the assigned sections of the book.

• Bring all of your course materials (textbook, notebook, pens/pencils, paper, calculator) to every class.

• Show proper etiquette during class. Do not talk, make excessive noise, or otherwise distract the class. You will be asked to leave and it will affect your grade.

Course Calendar

This is a tentative schedule of the course topics, assignments, and tests, and might be subject to change.

Week	Dates	Topic	Assignments	No classes
1	Aug 23-25	1. Circuits I Review	-	
2	Aug 30-Sept 1	1. Circuits I Review	-	
3	Sept 6-8	2. First Order RL and RC Circuits	HW 1, Quiz 1	Sept 6
4	Sept 13-15	3. Second Order RLC Circuits	HW 2, Quiz 2	
5	Sept 20-22	4. Introduction to the Laplace Transform	HW 3, Quiz 3	
6	Sept 27-29	4. Introduction to the Laplace Transform	HW 4, Quiz 4	
7	Oct 4-6	5. The Laplace Transform in Circuit Analysis	-	
8	Oct 11-13	5. The Laplace Transform in Circuit Analysis	HW 5, Quiz 5	
9	Oct 18-20	6. Introduction to Frequency Selective Ckts.	Midterm Monday Oct. 18	
10	Oct 25-27	7. Active Filter Circuits	HW 6, Quiz 6	
11	Nov 1-3	7. Active Filter Circuits	HW 7, Quiz 7	
12	Nov 8-10	8. Fourier Series	HW 8, Quiz 8	
13	Nov 15-17	9. The Fourier Transform	HW 9, Quiz 9	
14	Nov 22-24	9. The Fourier Transform	-	Nov. 25-26
15	Nov 29-Dec 1	10. Two-Port Circuits	HW 10, Quiz 10	Dec. 3

Academic Dishonesty

As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self-responsibility. The assumption that a student's work is a fair representation of the student's ability to perform is the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Any case involving academic dishonesty will be referred to the Office of the Dean of Students. The Dean will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the Office of the Dean of Students' homepage (Office of Student Life) at http://studentaffairs.utep.edu/dos for more information.
You can also refer to the IEEE website for information on our code of ethics:
http://www.ieee.org/about/corporate/governance/p7-8.html

American Disabilities Act

The University is committed to providing services, equipment, and accommodations to individuals with documented disabilities to provide them with equal opportunities to participate in programs, services, and activities in compliance with Sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990, and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass .

Discrimination Statement

I do not discriminate, nor will I allow discrimination, on the basis of race, color, national origin, sex, religion, age, disability, genetic information, veteran's status, sexual orientation, or gender identity. Members of the UTEP community are protected from discrimination and harassment by the State and Federal Laws.

COVID-19 Statement/Precautions

Due to the ongoing global situation, please stay home if you (1) have been diagnosed with COVID-19, or (2) are experiencing COVID-like symptoms. If you are feeling unwell, let me know as soon as possible, and alternative instruction will be provided. The Student Health Center, located in the Union Building East, is equipped to provide COVID-19 testing.
The Centers for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of

people. The best way that Miners can take care of Miners is to get the vaccine. The vaccine is widely available in the El Paso area, and will be available at no charge on campus during the first week on classes. For more information about local rates, testing, and vaccinations, please visit www.epstrong.org

University Resources

UTEP provides a wide variety of student services and support:

Technology Resources

- UTEP Technology Support: Students experiencing technological issues or challenges (e-mail, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. www.utep.edu/technologysupport
- UTEP Engineering Technology Center (ETC): Provides laptop and computer repair services for engineering students, as well as service requests for software. www.utep.edu/engineering/etc/

Academic Resources

- UTEP Library: Access to a wide range of resources including online, full-text access to thousands of journals and e-Books, plus reference services and librarian assistance for enrolled students. www.utep.edu/library/
- Math Resource Center for Students (MaRCS): Ask a tutor for help (including remotely) and explore available math resources like formula sheets, tables, and videos. www.utep.edu/science/math/marcs
- Advancement Center for Engineering Students (ACES): Students serving other students. Hybrid tutors provide tutoring for a wide range of topics including engineering, math and science, and also manages room reservations. www.utep.edu/engineering/student-resources/student-resources-aces.html

Individual/Well-Being Services

- Military Student Success Center: Assists personnel in any branch of service to reach their educational goals. www.utep.edu/student-affairs/mssc/
- Center for Accommodations and Support Services (CASS): Assists students with ADA-related accommodations, for coursework, housing, and internships. www.utep.edu/student-affairs/cass
- Counseling and Psychological Services: Provides a variety of counseling services including individual, couples, and group sessions, as well as career and disability assessments. www.utep.edu/student-affairs/counsel