# University of Texas at El Paso
# Electrical and Computer Engineering
# Electric Circuits 2
# Spring 2025, version 3
# ECE 2302

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|---|---|
| INSTRUCTOR: | Virgilio Gonzalez |
| OFFICE: | Eng Annex 333 |
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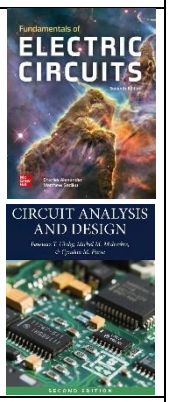
| Lecture HOURS: | TR 1:30PM – 2:50 PM, |
| OFFICE HOURS: | T 3:00 – 4:00 PM,<br>W 4:00 PM – 5:00 PM, |
| TEXT: (Also recommended references) | • Required Textbook via *McGraw Hill Connect* **subscription link in Blackboard**: Fundamentals of Electric Circuits, 7th Edition, Charles Alexander & Matthew Sadiku; McGraw-Hill Education, 2021, 992 pages ;ISBN: 9781260477641<br>• Free supplementary book: F.T. Ulaby, M. M. Maharbiz and C. M. Furse, Circuit Analysis and Design, Michigan Publishing, 2018, (https://cad2e.eecs.umich.edu/ )<br>  <br> |
| Catalog Description | Analysis of transient behavior in first-order and second order circuits. Circuit analysis using the Laplace transforms. Network functions and frequency response representation of circuits. Steady-state analysis of circuits fed by non-sinusoidal periodic signals using Fourier series. Two-port networks. Computer-aided analysis of circuits. |
| Prerequisites/ Co-requisites | Prerequisite: ECE 2301, MATH 2326, PHYS 2121, PHYS 2321<br>Corequisite: ECE 2102 |
| Software | MULTISIM or LTSPICE available for download through the ETC office, to get your own free license. Also through Bendor portals<br>https://www.utep.edu/engineering/etc/Software/<br>https://www.analog.com/en/resources/design-tools-and-calculators/ltspice-simulator.html<br><br>Available in E319 labs. Also Remote limited access through UTEP VPN, using Remote Desktop. |

**Course Outcomes**

1. Analysis of first order and second order circuits in the time domain.
2. Laplace Transform and circuit analysis using Laplace Transform.
3. Frequency response of circuits, passive first-order and second-order circuits.

4. Design and analysis of active filters in the frequency-domain, Bode plots.

**Tentative Calendar**

Note: Dates and topics are subject to change

| Week | Date | Topic | Hw | Exam |
|---|---|---|---|---|
| 1 | 1/20/25 | 1. Circuits I Review - | | |
| 2 | 1/27/25 | 1. Circuits I Review | HW #1 | |
| 3 | 2/3/25 | 2. Time-Domain Analysis of RL/RC Circuits | HW #2 | |
| 4 | 2/10/25 | 2. Time-Domain Analysis of RL/RC Circuits - | | |
| 5 | 2/17/25 | 3. Time-Domain Analysis of RLC Circuits | HW #3 | |
| 6 | 2/24/25 | 3. Time-Domain Analysis of RLC Circuits | HW #4 | Exam #1 |
| 7 | 3/3/25 | 4. Introduction to the Laplace Transform | HW #5 | |
| 8 | 3/10/25 | SPRING BREAK | | |
| 9 | 3/17/25 | 4. Introduction to the Laplace Transform | HW #6 | |
| 10 | 3/24/25 | 5. Circuit Analysis with Laplace Transform | HW #7 | |
| 11 | 3/31/25 | 5. Circuit Analysis with Laplace Transform | HW #8 | Exam #2 |
| 12 | 4/7/25 | 6. Passive Filters, | HW #9, | |
| 13 | 4/14/25 | 6. Passive Filters | HW #10 | |
| 14 | 4/21/25 | 7. Active Filters | HW #11 | |
| 15 | 4/28/25 | 7. Active Filters | | Exam #3 |
| 16 | 5/5/25 | 8. Two-Port Networks | HW #12 | |
| 17 | 5/12/25 | FINAL EXAM | | Final |

* Exam dates might be adjusted

**General Policies**

- Each session consists of regular lecture supported by supplementary materials. They are composed of brief notes, videos and assigned readings.
- Class sessions will be streamed simultaneously and recorded for later view. However, There is a delay in records availability.
- You are expected to dedicate about 2 to 3 hours per session to review the assigned materials, answer problems, submit postings and assignments.
- Students are encouraged to use MS Teams to interact in the allocated office hours to talk with the instructor. Face to face time is also available in the professor office. Please make an appointment reservation to guarantee availability.
- The ECE2102 is a corequisite to the course. However, the topics and the grading are separate.
- Technology Requirements
    - Course content is delivered via the Internet through the **Blackboard** learning management system (LMS). Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome is the most

supported browser for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

- You will need to have or have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, PDF reader tool (Adobe or others), web browser, and simulation tools. Check that your computer hardware and software are up-to-date and able to access all parts of the course.
- You will need to use Multisim or LTSpice to solve some assignments, and for the laboratories. Further instructions will be provided in the lab sections.
- If you encounter technical difficulties beyond your scope of troubleshooting, please contact the Help Desk as they are trained specifically in assisting with technological needs of students.

**GRADING**

| ITEM | Points / Total |
|---|---|
| Exams 1, 2, & 3 | 200 ea / 600 total |
| Weekly Assignments, progress in MH Connect | 150 total |
| Special Homework | 50 total |
| Class participation (Bb other discussions) | 50 total |
| Final Exam | 200 total |
| TOTAL | 1000+50 |

- Each element will accumulate points
- Exams will become available Fridays and will be due on Mondays via Blackboard. There are 4 exams requiring solving problems or applying concepts.
- **Show always all the procedure** to arrive to the solutions, including brief justifications for multiple choice selections. End results without the right procedure are considered conceptual errors. Procedures for exams will be uploaded separately.
- After the initial grading is done, to earn partial credit, students might need to identify the cause of the errors and provide with an additional correction document stating the proper procedure to obtain a valid answer. (maximum 50 % credit only)
- **Special Homework** Students will need to propose a solution to an open-ended problems and posting the concise proposal in the Blackboard discussion boards before the assigned deadline. Expected length is between one or two paragraphs per problem and attach needed graphics.
    - Afterwards, students are required to inspect at least two proposals from other students and make comments about the solutions. Responses must be posted no later than 48 hrs after the assignment initial submission. The length of the comments should be about one single paragraph.
- Letter scale will be **A:** 90%-100%; **B:** 80%-89.9%; **C:** 70%-79.9%; **D:** 60%-69.9%; **F:** below 60% of the reference grade.
- Some large attachments might require saving the document in a shared OneDrive folder and share the link with the instructor.
- Additional requirements may be stated in specific assignments.

## GENERAL COURSE POLICIES

- For email questions or concerns, please start the email subject line with " **ECE2302: …** " .
- Samples of student work will be collected for accreditation purposes. Please notify the professor, in writing, if there is any confidentiality restriction.
- **Late work** might be accepted if properly justified, however, it might be subject to penalizations. Special accommodations require the letters with instructions from CASS.
- The Professor will be available only during the assigned office hours or by appointment.
- Each piece of written work must include **ECE2302**, **name,** student **ID, TEAM** number (when applicable) at the **upper right corner** of the first page; and the **name** in all remaining pages.
- All printed work must have good presentation. Final results must be emphasized (example red underline or highlighted box)
- Online work must have in the first text line the name of the student and the team number when applicable.
- Detailed instructions for the **assignments** will be **provided later** in separate handouts through **Blackboard**

## AI ALLOWED WITH PROPER ACKNOWLEDGEMENT

- Use of AI technologies or automated tools, particularly generative AI such as ChatGPT or DALL-E, is ***only allowed with proper attribution given for its use***.
- Students must properly cite and give full credit to the program used upon submission of every relevant assignment. For example, text generated using ChatGPT must be cited:
    - Chat-GPT(version). Date of query (year/month/day). "Text of your query."
    - Generated using OpenAI. https://chat.openai.com/
- A short paragraph describing how the tool(s) was/were used for the assignment must be included.

## Academic Honesty, Accommodations and NETiquette

- It is expected that the students will conduct with integrity in all course areas. Do not attempt to engage in a dishonest activity such as copying, plagiarism, falsifying information, etc. The professor will take measures to prevent such instances and will bring a case to the university authorities. **USING CHEGG or other online tools for answering exams is not allowed**.
- Information about University wide policies could be found in the Dean of Students Web page at http://studentaffairs.utep.edu/Default.aspx?alias=studentaffairs.utep.edu/dos
- NETtiquette
    - Always consider audience. Remember that members of the class and the instructor will be reading any postings.
    - Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
    - When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
    - Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a

publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).

- The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order 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. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services.

## STUDENT RESOURCES

UTEP provides a variety of student services and support:

- UTEP Library: Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.
- History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- Military Student Success Center: UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.