University of North Texas, College of Engineering

EENG 2610.002: Circuit Analysis

Spring 2026

Monday, Wednesday 1:00 – 2:20 PM

NTDP D201

Instructor

- Shahram Rohani, Email: shahram.rohani@unt.edu
  Office Hours: (Room E245B) M/W 11:30 AM –12:30 PM
- GA: Fariha Rabbi, Email: FarihaRabbi@my.unt.edu
  Office Hours: (Room B250) Mon/Wed 1:30 – 4:00 PM

Check Canvas frequently for updated class information.

Course Description

- Introduction to electrical elements, sources and interconnects, Ohm's law, Kirchoff's laws, Mesh & Nodal analyses, superposition, Thevenin's & Norton's theorems; resistive circuits, Op-Amps, first and second-order circuits, sinusoidal AC analysis, AC power, three-phase, and magnetically coupled circuits. Credit hours: 3

Prerequisites

- MATH 1720; co-requisites: PHYS 2220/2240 for all and (MATH 3410 and EENG 2611 for electrical engineering students) with a C or better in each course.

Required Textbook

- Fundamentals of Electric Circuits, 7th Edition, McGraw Hill, 2021
  Authors: Charles Alexander and Matthew Sadiku
  ISBN: 978-1-260-22640-9

Course Requirements and General Policies

- The student is required to attend all scheduled lectures. Attendance will be taken for each class meeting. Lecture time will include vital activities such as taking quizzes and exams, problem solving, going over answers to questions in problem sets and quizzes, and reviews for exams. The student can be dropped from the course for three (3) unexcused absences in Lecture. An excused absence can only be guaranteed by obtaining, in advance, the instructor authorization. Please refer to https://policy.unt.edu/policy/06-039

- Please do not wait until the last minute. If you are having trouble with this class, please take advantage of the following support services:
  1. The Learning Center's Lead Tutors. You can access all of their services through their website: https://learningcenter.unt.edu/tutoring. They also have a video that overviews their services for the fall, including how to schedule an appointment! Here's the link: https://www.youtube.com/watch?v=HOggBsi3VME .
  2. The IEEE UNT Student Branch and IEEE-HKN Lambda Zeta Chapter will be hosting recitations for this course and a study hall. Details will be posted in the "Announcements" on Canvas.

3. There will be a recitation host for this course who will be supporting students through homework review sessions held after each homework deadline. More detail will be posted in the "Announcements" on Canvas.

4. Take advantage of the TA's office hours.

- The UNT Catalog procedures on cheating and plagiarism will be enforced. It is the duty of all students to protect their work so it is not available for others to represent as their own. This is especially true of files that are generated on the computer. Students who knowingly allow others to use their work are partners in this unethical behavior. For more details regarding the above policies and for your rights and responsibilities, please visit https://studentaffairs.unt.edu/dean-of-students/.

Assignments and Exams

- Homework will be assigned on a weekly basis and must be submitted by the due date and time and turned in at the beginning of the class period according to the instructions given each week. If you have an excused absence and are unable to come to class, you should email your assignment to me by the deadline. **Late homework will not be accepted.** Homework must follow the following guidelines; otherwise, it will be returned ungraded!

  1. Use standard 8 ½ x 11 paper (straight edge; no spiral)
  2. Number the pages and put them in order
  3. Staple the pages together
  4. Print your name, date, and the homework # on the top page
  5. Show your work clearly and highlight or circle your answers
  6. Place on the front desk as you enter the classroom before class begins

- There will be unannounced quizzes administered during the semester to evaluate understanding of relevant material. **No make-up quizzes will be given.**
- There will be **no extra credit**. There will be **no make-up quizzes or examinations** given unless prearranged with the instructor for a university approved excused absence. The final examination will be comprehensive over the entire semester's work.
- Exams will be based on text readings, handouts, class exercises, quizzes, class lectures and discussions. Students are responsible for all text material, regardless of whether we review the text material in class or not. **No make-up exams will be given**.
- Each student should retain graded lecture notes, quizzes, homework, tests, software-generated files, and laboratory reports to document errors in recorded grades.
- Requests for review of graded work must be emailed to the TA within a week of which such work is returned to the students. The instructor should be cc'd on this email. The request should be accompanied by a written justification of the request including any supporting data.

Grading Policies

- Homework 20%
- Quizzes 20%
- Exam 1 20%
- Exam 2 20%
- Final Exam 20%
- Final accumulated number score is on a 100-point scale.

Grade Distribution

90.0% - 100%	A
80.0% - 89.9%	B
70.0% - 79.9%	C
60.0% - 69.9%	D
59.9% & Below	F

Disability Accommodation

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information, please contact the Office of Disability Accommodation ODA website (http://www.unt.edu/oda) at 940-565-4323.

Useful Links

- UNT Academic Calendar: https://registrar.unt.edu/registration/spring-registration-guide
- Office of the Registrar: http://essc.unt.edu/registrar (schedule of classes and exams, etc.)
- Eagle Student Services Center: https://studentaffairs.unt.edu/index.html

Course Outline and Tentative Schedule

You can find the lectures slides and problem assignments on Canvas.

Week	Date	Topics	Reading
1	12-Jan	Voltage, Current, Power, Tellegen's	1.1-1.5
2	21-Jan	Circuit elements, Ohms' law, KCL, KVL	1.6, 2.1-2.4
3	26-Jan	Series & Parallel Circuits, Resistor Combinations	2.5-2.6
3	28-Jan	Wye/Delta, Dependent Sources	2.7-2.8
4	2-Feb	Nodal Analysis	3.2-3.3
4	4-Feb	Loop Analysis	3.4-3.6
5	9-Feb	Linearity, Superposition	4.2-4.3
5	11-Feb	Source Transformation, Thevenin's Theorem	4.4-4.5
6	16-Feb	Norton's Theorem, Max power transfer	4.6-4.8
6	18-Feb	Exam 1 review, Op Amp circuits	5.1-5.8
7	23-Feb	Exam 1	
7	25-Feb	Op Amp circuits, Capacitors, Capacitor Combinations	6.1-6.3
8	2-Mar	Inductors, Inductor Combinations; RC Op Amp circuits	6.4-6.6
8	4-Mar	First-order Circuit, Transient Response	7.1-7.3
9-Mar	11-Mar	Spring Break – No Class	
9	16-Mar	Pulse response, Second-order circuits	7.5-7.6, 8.1-8.4
9	18-Mar	Second-order circuits, oscillations	8.5-8.6
10	23-Mar	AC: sinusoids, forcing functions, phasors	9.1-9.3
10	25-Mar	Phasors, Impedance & Admittance, Phasor diagram	9.4-9.7
11	30-Mar	AC Circuit Analysis	10.1-10.3
11	1-Apr	AC Circuit Analysis	10.4-10.6
12	6-Apr	Instantaneous/Avg power; Max Avg Power Transfer	11.1-11.3
12	8-Apr	RMS Values, Apparent Power, Exam 2 review	11.4-11.5
13	13-Apr	Exam 2	
13	15-Apr	Complex Power, Power Factor correction	11.6-11.8
14	20-Apr	Balanced Three-Phase Circuits	12.1-12.7
14	22-Apr	Magnetically Coupled Circuits	13.1-13.2
15	27-Apr	The Ideal Transformer	13.5
15	29-Apr	Review for final exam	
Final	2-May	Final Exam	

The final exam will be on Saturday, May 2, 2026 from 10:00 AM to 12:00 PM.
https://registrar.unt.edu/exams/final-exam-schedule/spring

Reading Requirements:

The students are required to come prepared to every class with the material discussed in the previous class.

Class Evaluation by Students

The SPOT (Student Perceptions of Teaching) evaluation is a requirement for all organized classes at UNT and is available for your input at the end of the semester.

Course Learning Outcomes

The Course Learning Outcomes (CLOs) are listed below and are evaluated by surveys of self-assessment from students at the beginning and end of the semester. The results become part of ABET accreditation reports of the EE department.

[CLO-1] Understand abstracted lumped circuit model, the attributes of circuit elements (including dependent/independent voltage/current sources, Resistances), Ohm's law.

[CLO-2] Analyze lumped circuit models using Kirchhoff's laws (KCL and KVL), nodal method, and loop method.

[CLO-3] Be fluent with basic circuits (i.e., dividers, resistor combinations and transformations), and circuit analysis methods including linearity, superposition, Thévenin, Norton.

[CLO-4] Ability to analyze Op-Amp models and circuits.

[CLO-5] Understand the reasoning of the analysis methods for transients in linear DC circuits with capacitors and inductors, including first order and second order circuits.

[CLO-6] AC circuits: Phasor method, impedance method, and basic frequency-domain analysis methods.

[CLO-7] AC circuits: concepts of average and instantaneous power, RMS, and maximum power transfer

[CLO-8] Understand frequency response, Bode plots, filters, resonant circuits

[CLO-9] Learn how to analyze coupled coils, mutual inductance, and transformers.

Our EE Program Outcomes (POs)

Upon completion of our BSEE program, the students will be able to:

[PO-1] Apply knowledge of mathematics, engineering and science.

[PO-2] Design and conduct experiments to verify and validate the design projects developed by them and analyze and interpret data.

[PO-3] Develop project-based learning skills through design and implementation of a system, component, or process that meets the needs within realistic constraints.

[PO-4] Function on multidisciplinary teams.

[PO-5] Identify, formulate, and solve engineering problems.

[PO-6] Have an understanding of professional and ethical responsibility.

[PO-7] Communicate effectively.

[PO-8] Achieve broad education necessary to understand the impact of electrical engineering solutions in a global and societal context.

[PO-9] Understand learning processes, concepts of learning to learn, and engage in lifelong learning.

[PO-10] Achieve knowledge of contemporary issues.

[PO-11] Use techniques, skills, and computer-based tools for conducting experiments and carrying out designs.

[PO-12] Develop an appreciation for principles of business practices and entrepreneurship.

ABET Outcomes

3a- an ability to apply knowledge of mathematics, science, and engineering

3b- an ability to design and conduct experiments, as well as to analyze and interpret data

3c- an ability to design a system, component, or process to meet desired needs

3d- an ability to function on multi-disciplinary teams

3e- an ability to identify, formulate, and solve engineering problems

3f- an understanding of professional and ethical responsibility

3g- an ability to communicate effectively

3h- the broad education necessary to understand the impact of engineering solutions in a global and societal context

3i- a recognition of the need for, and an ability to engage in life-long learning

3j- a knowledge of contemporary issues

3k- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Relationship between the Course Learning Outcomes and Program/ABET Outcomes

The following table indicates the relationship between course learning outcomes (CLOs) and student/ABET outcomes.

CLO	**Student/ABET Criterion 3 Outcomes**						
	SO-1/ 3 [1]	SO-2/ 3 [2]	SO-3/ 3 [3]	SO-4/ 3 [4]	SO-5/ 3 [5]	SO-6/ 3 [6]	SO-7/ 3 [7]
1	X						X
2	X						X
3	X						X
4	X						X
5	X						X
6	X						X
7	X						X
8	X						X
9	X						X