University of North Texas
College of Engineering
EENG 2610 Circuit Analysis
Summer 2025

Instructor

Lei Zhan

Email: *lei.zhan@unt.edu*

Meeting time and classroom: **Monday & Wednesday 9:00 – 10:50 AM, NTDP E265**

Office hours:

Monday & Wednesday 2:00 – 3:30 PM, NTDP E245F

***Note*:** You are encouraged to discuss any questions you have during office hours. If you are unable to make it at these times, please make an appointment in advance via e-mail. I will correspond via email **ONLY** if you use your **my.unt.edu** student account. Anything else may be ignored.

Please check Canvas frequently for updated class information.

Required Textbook

- **Fundamentals of Electric Circuits, 7th Edition, 2021, Author: Charles Alexander and Matthew Sadiku, Publisher: McGraw-Hill, ISBN-13: 9781260226409**

Prerequisites

- MATH 1720 Calculus II
- Co-requisite: PHYS 2220/2240 Electricity and Magnetism
- EENG 2611 for Electrical Engineering students.

Course Description

- Introduction to electrical elements, sources and interconnects, Ohm's law, Kirchhoff's law, superposition and Thevenin's theorems. Resistive circuits, Op-Amp circuits, transients in RL, RC, and RLC circuits will be introduced. In addition, AC sinusoidal analysis, phasors, power, and frequency response will be covered.

Course Objectives

By the end of the course, you will learn

- Electrical elements, their interconnects, and how to analyze basic RLC and op-amp circuits making use of your newly acquired skills using:
  - Ohm's Law
  - Kirchoff's Law
  - Thevenin's and Norton's Theorems
- Sinusoidal analysis of basic RLC circuits.
- Single and Multiphase circuit analysis
- Filter Design

Course Learning Outcomes

The Course Learning Outcomes (CLOs): that is, the areas for student learning in this course are:

[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, three phase circuits.

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

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

Course Requirements

- Class attendance is required. Lectures and class discussions will contain vital information needed to help you understand the material and do well on the exams.
- Homework must be submitted on the due date. 10% will be deducted for late homework. No homework will be accepted after 24 hours unless a formal letter is provided regarding a medical or family emergency.
- There will be both announced and unannounced quizzes administered during the semester to evaluate understanding of relevant materials.
- There will be no make-up exams/quizzes given unless prearranged with the instructor for a university approved absence.
- Keep all your graded assignments, and tests for study and review. You should track your own progress using Canvas and be aware of current grades throughout the semester.
- Requests for reviewing of graded work must be e-mailed to the TA within a week after grading. You must **first** contact TA regarding a grade dispute prior to seeing me.
- Students are expected to communicate to the instructor any issue regarding their performance in class ahead of time. Please do not wait until the last minute.

Course Outline and Tentative Schedule

Week	Date	Topics	Reading
1	19-May	Voltage, Current, Power, Tellegen's, Circuit elements	1.1-1.6
1	21-May	Ohms' law, KCL, KVL	2.1-2.4
2	26-May	Memorial Day	
2	28-May	Series & Parallel Circuits, Resistor Combinations, Wye/Delta, Dependent Sources	2.5-2.7
3	2-June	Nodal Analysis, Loop Analysis	3.1-3.7
3	4-June	Linearity, Superposition, Source Transformation	4.1-4.4
4	9-June	Thévenin and Norton Theorems, Max Power Transfer	4.5-4.8
4	11-June	Op-Amps Model and Circuits Review for Midterm	5.1-5.8
5	16-June	Midterm Exam	
5	18-June	Capacitors, Capacitor Combinations, Inductors, and Inductor Combinations	6.1-6.5
6	23-June	First-order Circuit, Transient Response	7.1-7.3
6	25-June	Pulse response, RC Op-Amp Circuits	7.4-7.7
7	30-June	Second-order Circuits, Oscillations.	8.1-8.8
7	2-July	AC Circuits: Sinusoids, Forcing Functions, Phasors, Phasor Diagrams, Impedance & Admittance	9.1-9.7
8	7-July	AC Circuit Analysis	10.1-10.7
8	9-July	Instantaneous and Average Power, Maximum Average Power Transfer, RMS Values	11.1-11.4
9	14-July	Power Factor, Correction, 3-wire Circuits	11.5-11.8
9	16-July	Three-phase Circuits	12.1- 12.8
10	21-July	Frequency Response, Bode Plots, Bode Plots Sum, Filters, Resonant Circuits	14.1-14.9
10	23-July	Coupled Magnetic Circuits, Transformers Review for Final Exam	13.1 – 13.7
	Final Exam	**9:00 – 11:00 am, Friday, 7/25/2025**	

All course materials, including syllabus, lecture slides, homework assignments, and grades will be available in Canvas at https://unt.instructure.com.

Grading

- Attendance: 5%
- Homework: 25%
- Quizzes: 25%
- Midterm Exam: 20%
- Final Exam: 25%

Scales (based on total course point)

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Class Evaluation by Students

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

Course Technology and Skills Required for this class

Students will need access to a set of minimum technological resources and skills to succeed in this class.

Minimum Technology Requirements

- Computer
- Reliable internet access and web browser
- Canvas Technical Requirements (https://clear.unt.edu/supported-technologies/canvas/requirements)

Computer Skills and Digital Literacy

Course-specific technical skills that learners must have to succeed in the course:

- Using Canvas for accessing materials and grades as well as submitting files if needed.
- Converting files to PDF
- Using emails with attachments
- Downloading and installing software
- Using spreadsheet programs

Technical Assistance

Contact Student Help Desk for help with Canvas or other technology issues.
UNT Help Desk: UNT Student Help Desk site (http://www.unt.edu/helpdesk/index.htm)
Email: helpdesk@unt.edu
Phone: 940-565-2324

In Person: Sag Hall, Room 130 Walk-In Availability: 8am-9pm Telephone Availability:

- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

Laptop Checkout: 8am- 7pm

For additional support, visit Canvas Technical Help (https://community.canvaslms.com/docs/DOC- 10554-4212710328)

Information provided in the syllabus is subject to change.

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.

Academic Dishonesty

- All the provisions of the University code of academic integrity apply to this course. Any student found to have participated in academic dishonesty will receive a failing grade for the course and be reported to the department for appropriate action. Acts of academic dishonesty include but are not limited to: academic fraud (e.g. changing solutions to appeal a grade), copying or allowing one's work to be copied, fabrication/falsification, plagiarism, sabotage of others' work, substitution (e.g. taking an exam for someone else). In addition, it is my understanding and expectation that your signature on any test or assignment means that you neither gave nor received unauthorized aid. For homework and lab assignments, while discussion is allowed, direct copying is not and students must turn in individual submissions. Realize that mastery of the material in the homework and lab assignments will be essential for good performance on the exams. All students are required to know, observe and help enforce the UNT Code of Student Academic Integrity.
- Please visit http://www.unt.edu/csrr for your rights and responsibilities.