EENG 2610: Circuit Analysis

Spring 2026

Section 003: Tuesdays and Thursdays 4:00 P.M. - 5:20 P.M.

Classroom: E265

Instructor

- Dr. Hyusim Park, Office: E255E Email: Hyusim.Park@unt.edu
  Office Hours: Tuesday and Thursday, 2:30 P.M. – 4:00 P.M.

Note that unexpected events may occur, so please sending an email to Hyusim.Park@unt.edu in advance to confirm the meeting, if possible. Emails to the Instructor should always have "EENG 2610" in the subject line to help identify them. If you don't hear from me in a reasonable time (~ 1 day, or less if it's urgent), please re-send your email.

NOTE: I will correspond via email **ONLY** if you use your **my.unt.edu** student account. **Anything else will be ignored and deleted.**

- TA: TBD, Office Hours: TBD, Email: TBD

Required Textbook

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

Course Description

- Introduction to electrical elements, sources and interconnects, Ohm's law, Kirchoff's law, superposition and Thevenin's theorems to analyze resistive, Op-Amp, RC, RL, and RLC circuits including sinusoidal analysis and frequency response.

Course Webpage

- ALL course related material will be posted on the course webpage which is available through Canvas (https://unt.instructure.com).

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 AC circuit analysis
- Circuit analysis with magnetically coupled coils

Course Outline and Tentative Schedule

- All course materials, including syllabus, lecture notes, homework assignments, and grades are available in Canvas at https://unt.instructure.com
- **Students must bring a calculator to every class**

TOPIC	DESCRIPTION
1	Course Introduction & Ch1. Basic concepts (Current, Voltage, Power and Energy, Sources)
2	Ch2. Basic Laws (Ohm's Law, Kirchoff's Laws, Serries and Parallel Resistors, Wye-Delta Transformation)
3	Ch3. Methodes of Analysis (Nodal and Mesh analysis)
4	Ch4. Circuit Theorems (Linearity, Superposition, Thevenin, Norton and Maximum power transfer)
5	Ch5. Operational Amplifiers (Basic of the Op-Amps))
6	Ch6. Capacitors and Inductors
7	Ch7. First-Order Circuits (RC, RL, Op-amp)
8	Ch8. Second-Order Circuits (RLC)
9	Ch9. Sinusoids and Phasors (Sinusoids, Phasors, Impedance and Admittance, Frequency Domian)
10	Ch10. Sinusoidal Stead-State Analysis (Nodal, Mesh, Superposition, Source Transformation, Basic AC circuit analysis)
11	Ch11. AC Power Analysis (Power, Maximum Average Power, RMS) and Ch12. Three-Phase circuits
12	Ch13. Magnetically Coupled Circuits (Mutual Inductance, Transformers) (Time permitting)

Grading Policies

- There will be no extra credit.
- No make-up quizzes or exams will be offered unless prearranged with the instructor for a university approved absence. (Defined by UNT Policy 06.039.)
- You have 1 week to contest any grade once returned.
- Assuming there is a GA/TA for the course, you must **first** contact them regarding a grade dispute prior to seeing me.

COURSE PERFORMANCE MEASURES	
Homework	20%
Quizzes (Unannounced)	10%
2 Exams	40%
Final Exam	30%
Total	100%

- A composite course score will be computed for the grading assessment. Failure to achieve passing performance for the composite score will result in a final course grade of **F**. Once passing performance has been determined, the final grading for the composite course score will be done as follows: **A** > 90%, 90% > **B** > 80%, 80% > **C** > 70%, 70% > **D** > 60% and **F** < 60%. Grades will be curved if deemed necessary.
- Grades cannot be changed after they have been electronically entered into the university's system except for instructor errors. Any extenuating circumstances that may adversely affect your grade must be brought to my attention before the final course grades are recorded. To be considered, such circumstances must be unusual, unavoidable, and verifiable.

Assignments, Quizzes, and Exams

- Exams will be based on textbook readings, handouts, class exercises, class lectures, discussions, and homework assignments. Students are responsible for all text material, regardless of whether we review the text material in class or not.

Course Learning Outcomes (CLOs)

- Course Learning Outcomes (CLOs), that is, the areas for students 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] AC circuits: three phase circuits.

[CLO-9] Learn how to analyze circuits utilizing transformers (ideal) and coupled coils/mutual inductance.

Course Requirements and General Policies

- Class attendance is mandatory however roll call will not be conducted. Research has shown that students who attend class are more likely to be successful. You should attend every class unless you have a university excused absence such as active military service, a religious holy day, or an official university function as stated in the Student Attendance and Authorized Absences Policy. If you cannot attend a class due to an emergency, please let me know. Your safety and well-being are important to me
- Lectures and class discussions will contain vital information needed to do well on the exams.
- The students are required to come prepared to every class with the material discussed in the previous class.

- Everyone must turn in individual homework. Homework must be done individually (you will learn the most from this). Any evidence of group participation or simply copying others' homework will be treated and interpreted as academic dishonesty.
- Please remember to turn off phones prior to class. Please note that portable phones, pagers, and late arrivals are disruptive to the instructor and to your peers. The use of cell phones, beepers, or communication devices is disruptive and is therefore absolutely prohibited during class or while taking exams or quizzes. Turn off your cell phone while in class. If I catch you using these devices, your final grade will be reduced by 10% for each and every transgression and you will be asked to leave the class. Except in emergencies, students using such devices must leave the classroom for the remainder of the class period. I know that some of you may wish to take notes directly on your computer and I have no problem with that. If however, you choose to access your email, search the web, play games, or instant messenger your friends during class, you will have 5% deducted from your final grade for each and every transgression. This penalty will be at the sole discretion of the instructor. If for some reason I am late arriving at class, it will be because of circumstances beyond my control. You are expected to remain for 15 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.

  <u>COVID-19 Impact on Attendance</u>

  While attendance is expected as outlined above, Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course defined above.

  It is important that you communicate with the professor and the instructional team **prior to being absent**, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals.

  Please inform the professor if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community. If you are experiencing any symptoms of COVID (https://www.cdc.gov/coronavirus/2019-ncov/symptoms testing/symptoms.html) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to

  coming to campus. UNT also requires you to contact the UNT COVID Team at COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure.

  • Please visit http://www.unt.edu/csrr for your rights and responsibilities.

Disability Accommodation

- The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodation at any time; however, ODA notices of reasonable 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 reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (http://www.unt.edu/oda). You may also contact ODA by phone 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 an F in the class, a record of the offense will be kept in the Office of the Dean of Students and may be subject to further disciplinary 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.