EENG 3304: Linear Circuits Analysis –I

Spring 2026 Syllabus

Instructor Information:

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Office Hours:

Monday	: 11:30AM to 1:00PM
Wednesday	: 11:30AM to 1:00PM
Additional Hours	: By appointment

Course Description:

The objective of this course is to study DC and AC circuit analysis techniques; Kirchhoff's Laws; Thevenin and Norton transformations; transformers; DELTA to Y transformations; operational amplifiers; 1st order circuits and brief introduction to 2nd order circuits.

The student learning objectives are:

1. Explain the concept of electric potential, current, and power.
2. Identify concepts of electric network topology: nodes, branches, and loops.
3. Describe the relationship of ideal voltage and current in resistors, capacitors and inductors.
4. Describe the relationship of ideal voltage and current in mutual inductance.
5. Apply Kirchhoff's Voltage Law (KVL) to analyze electric circuits.
6. Apply Kirchhoff's Current Law (KCL) to analyze electric circuits.
7. Explain the concept of Thevenin equivalent.
8. Explain the concept of Norton equivalent.
9. Apply Thevenin equivalent to circuits.
10. Apply Norton equivalent to circuits.
11. Analyze simple operational-amplifier circuits using an ideal op amp model.
12. Describe simple transformer circuits.
13. Perform transient analysis of first-order circuits.
14. Apply the phasor transform to sinusoidal steady state analysis of electric circuits.
15. Characterize the response of second order circuits.
16. Understand the importance of electric circuits in the real world.

Recommended Textbook:
Alexander, Charles K. and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, Seventh Edition, McGraw-Hill, **ISBN10**: 1264144016 | **ISBN13:** 9781264144013

Evaluation and Grading:

The course grade will be based on the following activities:

1. **Tests (60%):**
   There will be four tests as given in the outline. There will be a grade replacement policy. For example, if your Test 2 grade is better than Test 1, then Test 1 grade will be replaced with Test 2. This approach will be followed for other tests. For Test 4, minimum score that you will earn is the average of previous three tests.

   It is important that you should attend **ALL** tests and score at least 50% of grades in every test to be eligible for grade replacement policy. If you did not score 50% in any of the tests, your grades will not be replaced.

   All tests and final exams are CLOSED books and notes; however, a cheat sheet is allowed.

2. **Homework (20%)**
   There will be four homework assignments.

3. **Final Exam (20%):**
   Final exam as per University Schedule. Open books and notes.

90% and above:	A
80% and above and less than 90%:	B
70% and above and less than 80%:	C
60% and above and less than 70%:	D
Below 60%:	F

Students are encouraged to read the academic honesty policy (Student Standards of Academic Conduct).

Course Outline:

Schedule	Topics	Assignments
Week 1: (Jan 12-Jan 17)	Basic Concepts	Review Syllabus
Week 2: (Jan 19-Jan 24)	Basic Laws	
Week 3: (Jan 26-Jan 31)	Methods of Analysis	HW1 due on 1/28/26
Week 4: (Feb 2-Feb 7)	Circuit Theorems	Test 1 on 2/4/26
Week 5: (Feb 9- Feb 14)	Capacitors and Inductors	
Week 6: (Feb 16 – Feb 21)	AC Circuits	HW 2 due on 2/18/26
Week 7: (Feb 23 – Feb 28)	AC Circuits	
Week 8: (March 2 – March 7)	Sinusoidal Steady State Analysis	Test 2 on 3/4/26
Week 9: (March 16 – March 21)	AC Power Analysis	
Week 10: (March 23 – March 28)	Magnetically Coupled Circuits	HW3 due on 03/25/26
Week 11: (March 30 - April 4)	First Order Circuits	Test 3 on 4/1/26
Week 12: (April 6 – April 11)	Second Order Circuits	
Week 13: (April 13 – April 18)	Operational Amplifiers	HW4 due on 04/15/26
Week 14: (April 20 – April 25)	Review	Test 4 on 4/22/26
Week 15: (April 27 – May 2)	Final Exam	As per university schedule