EENG 3304: Linear Circuits Analysis –I

Spring 2020 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 in office or via zoom

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 course 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, Fifth Edition, McGraw-Hill, 2013, ISBN 978-0-07-338057-5

Evaluation and Grading:

The course grade will be based on the following activities:

1. **Homework Assignments (50%):**
   Homework will be assigned as mentioned in the course outline below. There will be five homework assignments and it should be submitted through Canvas using pdf or word format. No late submissions allowed. Collaboration on homework assignments is strongly encouraged, however expecting a disclaimer statement at the end of your assignments if you have discussed with the students in the class or someone outside. All resources, including materials obtained from the internet should be properly acknowledged.

2. **Tests (40%):**
   There will be four tests of duration 1 hour each 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 the 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 should 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 test, your grades will not be replaced.
   All tests are open books and notes; however, no internet resources should be used.

3. **Final Exam (10%):**
   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 13)	Basic Concepts	Review Syllabus
Week 2: (Jan 20)	Basic Laws	HW1 due on 01/29/20
Week 3: (Jan 27)	Methods of Analysis	Test 1 on 2/05/20
Week 4: (Feb 3)	Circuit Theorems	HW2 due on 2/12/20
Week 5: (Feb 10)	Capacitors and Inductors	
Week 6: (Feb 17)	AC Circuits	HW3 due on 2/20/20
Week 7: (Feb 24)	Review of topics studied in Week 1 through Week 5	
Week 8: (March 2)	Sinusoidal Steady State Analysis	Test 2 on 3/4/20
Week 9: (March 16)	AC Power Analysis	
Week 10: (March 23)	Magnetically Coupled Circuits	HW4 due on 3/18/20
Week 11: (March 30)	First Order Circuits	Test 3 on 3/25/20
Week 12: (April 6)	Second Order Circuits	HW5 due on 4/08/20
Week 13: (April 13)	Operational Amplifiers	Test 4 on 4/15/20
Week 14: (April 20)	Review	
Week 15:	Final Exam	