ENEE207: Electric Circuits (Spring 2019)

1. General Information

Time: Lecture 31302 T/R 10:00AM - 11:15PM Location: SC416
Lab 31303 T/R 11:25AM – 12:15PM Location: SC416

Instructor: Professor Lan Xiang (Science Center 436F)
Email: Lan.Xiang@montgomerycollege.edu
Phone: (240) 567-1740
Office Hours: MW 12 – 1:00pm; 2:30pm – 3:00pm, TR 9:00am – 10:00am

Required Text: Fundamentals of Electric Circuits, 6th Edition, by Charles K. Alexander and Matthew N.O. Sadiku, McGraw-Hill, 2017, ISBN: 9780078028229.
All course materials including lab manuals, homework assignments are available on MyMC.

2. Course Objective:

Design, analysis, simulation, construction and evaluation of electric circuits. Basic concepts of electrical engineering such as terminal relationships; applications of Kirchhoff's laws to simple resistive circuits; solution of resistor networks using mesh and node analysis and Thevenin and Norton's theorems; transient analysis of first and second-order circuits; DC and AC steady state analysis; frequency response and transfer functions; ideal op-amp circuits and diode and transistor circuits.
PREREQUISITE: *PHYS262.* PRE- or COREQUISITE: *MATH282. Three hours lecture, two hour laboratory each week.*

3. Course Structure:

The course will consist of class lectures, homework assignments, in-class quizzes, exams, and weekly labs. Quizzes will be given randomly in the beginning of a class without advance notice. The lowest score of the quizzes will be dropped. **Students have to bring the calculator every class.** Students are highly recommended to review the materials right after each lecture.

The lecture period will be followed by a laboratory period where the students will implement and test their designs of the experiment. Each experiment may require the student to create the design, simulate the design, construct the circuit and measure the performances of the circuit.

4. Grading Policy:

Homework	10 %
Quizzes	15 %
Midterm 1	20 %
Lab	25 %
Final	30 %
Total	100 %

The final grade is based on the following:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	below 60%

NOTES:

1. **Late Policy:** No make-up for in-class quizzes if missed. If a student has any documented excused lateness or absence, please talk to the instructor within 24 hours for special arrangement. **Make-up exams** will be allowed **ONLY** for documented excused absences and with prior permission from the instructor. Late homework and prelab will NOT be accepted!

2. **Lab/Materials:**
   - Check Lab Guideline for lab requirements.
   - Each student is required to purchase a kit from the bookstore that contains a Breadboard and a Jumper Wire Kit. The kit is also used in ENEE245.
   - Each student is responsible for the proper care of equipment/materials issued. Any damage to, or loss of, equipment/materials should be reported to the instructor/lab staff immediately. At the end of a lab, you MUST clean up your work area and return all equipment/materials to its original location. All the equipment must be shut down when you finish with it.

3. **Support Services**: Any student who may need an accommodation due to a disability, please make an appointment to see me during my office hour. A letter from Disability Support Services authorizing your accommodations will be needed. Any student who may need assistance in the event of an emergency evacuation must identify to the Disability Support Services Office; guidelines for emergency evacuations for individuals with disabilities are found at *http://www.montgomerycollege.edu/dss/evacprocedures.htm*

3. **Academic Honesty**: All homework, quizzes, labs, and examinations are to be the results of a student's own efforts. Any cheating, copying, or academic dishonesty could result in a failing grade for the assignment and the course. You may discuss your work with classmates to the point of exchanging general ideas, but you may not copy from one another. You may also not give any paper or electronic copies of any parts of your work to other students to look at.

In addition to course requirements and objectives that are in this syllabus, Montgomery College has information on its web site (see link below) to assist you in having a successful experience both inside and outside of the classroom. It is important that you read and understand this information. The link below provides information and other resources to areas that pertain to Student Success such as: Student Behavior (Student Code of Conduct); Student e-mail, College Tobacco Free Policy; Course Withdrawal and Refund Information; Resources for Military Service Members, Veterans and Dependents; how to access information on delayed openings and closings; how to register for Montgomery College's Alert System and how closings and delays can impact your classes. Important Link: http://cms.montgomerycollege.edu/mcsyllabus/

ENEE 207 Course Outline (Spring 2019)

Wk	Dates	TOPICS	Chapters
1	1/22	L1. Introduction, Basic Concepts	1.1-1.5
	1/24	L2. Circuit Elements (voltage/current sources, R/L/C)	2.1,2.2,6.1-6.4
2	1/29	L3. Circuit Topology, Kirchhoff's Laws	2.3-2.4
	1/31	L4. R/L/C Combine, Voltage/Current Division	2.5-2.6, 6.3,6.5
3	2/5	L5. Nodal Analysis	3.1-3.3
	2/7	L6. Mesh Analysis	3.4-3.5
4	2/12	L7. Nonlinear Components and Linear Models	Notes
	2/14	L8. Operational Amplifiers (Ideal Model)	5.1-5.7
5	2/19	L9. Linearity and Superposition	4.1-4.3
	2/21	L10. Source Transformation	4.4
6	2/26	L11. Thevenin's Theorem	4.5
	2/28	L12. Norton's Theorem	4.6
7	3/5	Midterm Review	Notes
	3/7	**Midterm Exam**	
8	3/12	**Spring Break**	
	3/14	**Spring Break**	
9	3/19	L13. AC circuits, Sinusoids, Phasors	9.1-9.3
	3/21	L14. Phasors, Impedance, Series and Parallel Combines	9.4-9.5
10	3/26	L15. Sinusoidal Steady-State Analysis (Nodal & Mesh etc)	9.7, 10.2, 10.3
	3/28	L15. Sinusoidal Steady-State Analysis (Thevenin & Norton)	10.4-10.7
11	4/2	L16. Transfer Function, Passive Filters	14.1,14.2,14.7
	4/4	L17. Active Filters	14.8
12	4/9	L18. Transient Analysis, Source-Free RC/RL	7.1-7.3
	4/11	L19. Step Response of RC and RL circuits	7.4-7.6
13	4/16	L20. Second-Order Circuits (series RLC)	8.1-8.3, 8.5
	4/18	L21. Second-Order Circuits (general case)	8.7
14	4/23	L22. Laplace Transform and Application	16.1 – 16.4
	4/25	L23. AC Powers, Complex Power	11.1 – 11.7
15	4/30	L24. Linear regulators, Switching supplies	Notes
	5/2	Final Review	Notes
16	**Final Exam: May 7, Tuesday 10:15 AM – 12:15 PM, SC416**		

Note: Highlighted dates in yellow are homework due dates.

ENEE207 Lab Schedule

Labs	Dates	Topics
Lab 0	Week 1	Introduction to Test and Measurement Equipment
Lab 1	Week 2	Introduction to PSpice Simulation
Lab 2	Week 3	A Simple AC Circuit
Lab 3	Week 4	Clock Pulse Generator
Lab 4	Week 5/6	Op-Amp Circuits
Lab 5	Week 9	Thevenin and Norton Equivalent Circuits
Lab 6	Week 10/11	Complex Circuit Nodal Analysis
Lab 7	Week 12	Transfer Functions
Lab 8	Week 13	Passive Filter Design
Lab 9	Week 14	Active Filter Design
Lab 10	Week 15	Transient Circuits

Note: All lab reports are due on Tuesday of the following week after the experiment.