

ECE 2005 – Electric Circuits

Winter 2018

**Syllabus
and
Course Overview**

Dr. Michel Sultan

Instructor: Dr. Michel Sultan

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Office: DH 131

Office Hours: M & W 2:30 – 4:30 pm

By appointment or walk-ins welcomed.

Prerequisites: EGR 2400; Prerequisite or co-requisite: APM 2555

Class Website: All lecture notes, labs, exam homework and solutions will be posted on Moodle -

<https://moodle.oakland.edu/moodle/login/index.php>

TAs (tentative): Wayne Morrell (wmmorrel@oakland.edu) - Lab

Zhiwei Li (zli@oakland.edu) - Grading

University Catalog Description:

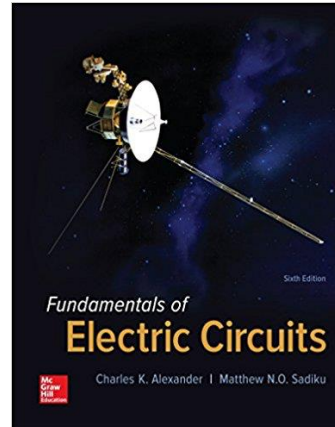
Modeling and analysis of circuits with dependent sources; non-ideal operational amplifiers. Transient and forced responses in RC, RL, and RLC circuits. Series and parallel resonant circuits. AC power, three phase circuits, magnetically coupled circuits. Wye-Delta transforms. Introduction to frequency response. Use of P-Spice with laboratory.

ECE 2005: Electric Circuits - Textbook

“Fundamentals of Electrical Circuits,”

C. Alexander & M. Sadiku,

Sixth Edition, ISBN 978-0078028229



ABET

- Engineering programs in the United States are accredited by the Accreditation Board for Engineering and Technology (ABET)
- All engineering students in such accredited programs (including all engineering majors at Oakland University) must demonstrate, before graduation, that they have achieved the (appropriate) ABET program outcomes
- For ABET accreditation, all original homework, lab reports and exams will be collected back on the same day it is returned to the students

ABET Program Outcomes (11)

- a) an ability to apply knowledge of mathematics, science, and engineering
- b) an ability to design and conduct experiments, as well as to analyze and interpret data
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d) an ability to function on multi-disciplinary teams
- e) an ability to identify, formulate, and solve engineering problems
- f) an understanding of professional and ethical responsibility

- g) an ability to communicate effectively
- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Academic Conduct

Students are expected to read, understand and comply with the Academic Conduct Regulations of Oakland University, found in the Undergraduate Catalog and the Undergraduate Student Handbook (<http://www.oakland.edu/handbook> => Code of Student Conduct => Academic Conduct Regulations). Violations will be taken before the Academic Conduct Committee. Students found guilty of academic misconduct in this course will receive a grade of 0.0 in addition to any penalties imposed by the Academic Conduct Committee. A latest version of the Academic Conduct Committee's procedures is in the Deans' office. We will talk in class more about the do's and don'ts of working together and individually.

Use of Cell Phones

The use of cell phones during class and exam meetings for voice and texting will NOT be allowed. Your cooperation is greatly appreciated.

No Cell Phone Use

During exams, use standalone calculator, no cell phone



Course Content

- Chapter 2: Basic Laws (review)
- Chapter 3: Nodal & Mesh Analysis, Transistors
- Chapter 4: Circuit Theorems
- Chapter 5: Operational Amplifiers
- Chapter 6: Capacitors & Inductors
- Chapter 7: First Order Circuits
- Chapter 8: Second Order Circuits
- Chapter 9: Sinusoids and Phasors
- Chapter 10: Sinusoidal Steady-State Analysis
- Chapter 11: AC Power Analysis
- Chapter 13: Magnetically Coupled Circuits
- Chapter 14: Frequency Response
- Chapter 15: Laplace Transform
- Chapter 16: Laplace Transform Applications

Class Schedule (Tentative)

ECE 2005 Winter 2018 - Schedule						Lab	Homework	
Week	Day	Date	Lecture/ Exam	Chapter	Lecture	Location: EC 556	Assign	Turn-in
1	Mon	1-Jan				No Lab		
	Wed	3-Jan	L 01	2, 3	Overview; Basic laws, DC			HW1(2-3-4)
2	Mon	8-Jan	L 02	3	Methods of DC analysis	No Lab		
	Wed	10-Jan	L 03	4	Circuit theorems (DC)			
3	Mon	15-Jan			MLK Day - No Class	Lab 1 - Delta-Wye		
	Wed	17-Jan	L 04	5	Operational amplifiers			HW2(5-6)
4	Mon	22-Jan	L 05	6	Capacitors and Inductors	Lab 2 - Mesh/Nodal		
	Wed	24-Jan	L 06		Catch-up / Review			
5	Mon	29-Jan	Exam 1		Chapters 2, 3, 4, 5, 6	No Lab		
	Wed	31-Jan	L 07	7	1st order transient circuits			HW3(7,8)
6	Mon	5-Feb	L 08	8	2nd order transient circuit analysis	Lab 3 - Op Amps		
	Wed	7-Feb	L 09	8	2nd order transient circuit analysis			
7	Mon	12-Feb	L 10	9	Sinusoids and phasors for AC analysis	Lab 4 - 1st Order Circuits	HW4(9, 10)	HW3(7,8)
	Wed	14-Feb	L 11	10	AC analysis, steady state			
8	Mon	19-Feb			Winter recess-Feb 18 to Feb 25	No Lab		
	Wed	21-Feb						
9	Mon	26-Feb	L 12	10	AC analysis, steady state	Lab 5 - 2nd Order Circuits		
	Wed	28-Feb	L 13		Catch-up / Review			
10	Mon	5-Mar	Exam 2		Chapters 7, 8, 9, 10	No Lab		
	Wed	7-Mar	L 14	11	AC power analysis			HW5(11,13)
11	Mon	12-Mar	L 15	11	AC power analysis	Lab 6 - Transformers		
	Wed	14-Mar	L 16	13	Magnetically coupled circuits			
12	Mon	19-Mar	L 17	13	Magnetically coupled circuits	No Lab		
	Wed	21-Mar	L 18	14	Frequency response, bode plots, filters			HW6(14,15)
13	Mon	26-Mar	L 19	14	Frequency response, bode plots, filters	Lab 7 - Filters & Intro to Lab 8		
	Wed	28-Mar	L 20	14	Frequency response, bode plots, filters			
14	Mon	2-Apr	L 21	15	Laplace transforms	Lab 8 / Final Project		
	Wed	5-Apr	L 22	15	Laplace transforms			HW7(15,16)
15	Mon	9-Apr	L 23	16	Laplace transforms Applications	Lab 8 / Final Project (if needed)		
	Wed	11-Apr	L 24		Catch-up			
16	Mon	16-Apr	L 25		Review			
17	W 25-Apr 7:00-10pm		Final Exam	Chapters 11,13, 14, 15, 16		W18@classes@nd.edu April 7@10pm		

ECE 2005 – Grades

Homework:

Homework will be due one week after assignment; it must be turned in before start of the class. **Late homework will not be accepted.** Solutions will be posted on Moodle after the assignments have been graded, and returned to the students. Use 8.5" x 11" paper. **Use only one side of each page, box the final answers, and staple your work. Neatness counts towards the grade.**

Laboratory:

There will be 8 laboratory assignments to be held once per week. All assignments will be posted on Moodle. Each lab session will be led by the Teaching Assistant (TA). Laboratory teams (usually 2 students per team) will be formed during the first lab meeting by the TA. The lab reports format and due dates will also be given by the TA. There are no provisions for missed labs. Those participating in OU sanctioned sports events will provide an official letter to the TA as soon as possible for alternative arrangements to be made. For a business trip, notify the TA before the trip and before the lab, and bring a letter from your manager. In case of serious illness or medical emergency, bring a note from your doctor.

Note: Students who do not earn a passing grade in the laboratory will get a failing grade

Exams:

There will be 2 midterm exams and one final.

There are NO provisions for makeup exams.

To pass the course a student must earn a passing grade in the lab. A student who does not earn a passing grade in the laboratory will get a failing grade in the course.

Homework	15%
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Laboratory	15%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	25%
Class Participation	5%
Total:	100%

Laboratory (15%)

ECE2005	Day	Time	Location
11302	Tuesday	1:00-4:00 pm	556 EC
11303	Friday	1:00-4:00 pm	556 EC
13725	Friday	5:00-8:00 pm	556 EC

- TA: Wayne Morrell (Tentative)
- There will be 8 laboratory assignments to be held once per week
- All laboratory assignments will be posted on Moodle and the work will be led by the Teaching Assistant (TA)
- Laboratory teams (usually 2-3 students per team) will be formed during the first lab meeting by the TA
- The lab reports format & due dates will also be given to you by the TA
- There are NO provisions for missed labs

- Those participating in OU sanctioned sports events will provide an official letter to the TA as soon as possible for alternative arrangements to be made.
- For a business trip, notify the TA before the trip if possible and bring a letter from your manager.

In case of serious illness, bring a note from your doctor