

WEST VIRGINIA UNIVERSITY
Lane Department of Computer Science & Electrical Engineering
EE 221 INTRODUCTION TO ELECTRICAL ENGINEERING
 Spring 2015
 3 Lecture Credit Hours

Instructor: Dr. Mark Jerabek
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Office Hours: Scheduled: MWF 10:00 - 11:00 and TTh 9:15-10am or by appointment; however, I have an open-door policy. If my office's door is open whenever I am in, I will be more than glad to help you. If my door is closed, I'm busy or gone.

Class Time: 12:00-12:50 Class Location: 209 MRB

Prerequisites: PHYS 111, MATH 156

Required Text: Fundamentals of Electric Circuits, 5th Ed. C.K. Alexander and N.O. Sadiku, McGraw-Hill, 2013
Course website: <http://www.ems.wvu.edu/ee221> you cannot access the website this semester. Instructor is not responsible for lack of access to the website. Please DO NOT wait to the last minute to download course materials.

Objective: To acquaint the student with electrical engineering units, circuit elements, circuit laws, measurement principles, mesh and node equations, network theorems, operational amplifier circuits, energy storage elements, sinusoids and phasors, sinusoidal steady state analysis, average and RMS values, complex power.

Expected Learning

Outcomes: Students will acquire fundamentals to **analyze** and solve **basic** electrical circuits in DC and sinusoidal steady-state. Upon the completion of the course, students will be able to apply

1. Ohm's law, Kirchhoff's Laws, voltage and current division, mesh current, node voltage, Thevenin, Norton equivalents, power calculation to basic DC and AC circuits
2. PSPICE

Tentative Lecture Schedule:

<u>Lecture no.</u>	<u>Subject</u>	<u>Topic</u>	<u>Chapter</u>
1	Introduction	Class Policy Introductory Discussion	
2	Circuit Variables	Overview, SI Units, Voltage, Current, Power and Energy	1
3	Circuit Elements	Sources, Resistance	2
4		Ohm's Law	2
5	Voltage & Current Laws	Nodes and Branches	3
6		Kirchhoff's Laws	3
7		Labor Day	3
8		Single-loop Circuit	3
9		Dependent Sources	3
10		Resistors in Series and Parallel	3
11		Voltage Division	3
12		Current Division	3
13	<u>Exam # 1</u>		
14	Techniques of Circuit	Introduction	4
15	Analysis	Node Voltage Method	4
16		Node Voltage Method	4

17		Mesh-Current Method	4
18		Mesh-Current Method	4
19		Node vs. Mesh Comparison	4
20		Superposition	5
21		Source Transformations	5
22		Thevenin and Norton Equivalents	5
23		Maximum Power Transfer	5
		Delta-to-Wye Equivalent Circuits	5
24	The Operational Amplifier	Characteristics, Inverting, Summing Circuits	6
25		Noninverting, Difference Circuits	6
26	<u>Exam # 2</u>		
27	Inductors & Capacitors	Inductor, Capacitor	7
		Series, Parallel Combinations	7
28	Sinusoidal Steady-State	Sinusoidal Source and Phasor	10
29	Analysis	Passive Circuit Elements in Phasor Domain	10
30		Kirchhoff's Laws in Frequency Domain	10
31		Node-Voltage Mesh-Current Methods	10
32		Superposition	10
33		Source Transformations	10
34		Thevenin and Norton Equivalents	10
35	Sinusoidal Steady-State	Instantaneous Power	11
36	Power Calculations	Average and Reactive Power	11
37		Average and Reactive Power	11
38		Apparent Power & Power Factor	11
39		Thanksgiving Recess	
40		Thanksgiving Recess	
41		Thanksgiving Recess	
42		Effective (rms) Value	11
43		Power Calculations, Max. Power Transfer	11
44	<u>Exam # 3</u>		
45		Review	
46		Review	
47		Review	

Regularly scheduled University final exam

Grading Policy:

There will be three exams plus a final exam; Each hourly exam counting 20%, and the final exam,30%.. There may be some unannounced quizzes given during the semester. Homework average plus quiz average will equal 10%of your grade. The final grade will be the average of the five scores. Course grades will be assigned on a standard scale: 90, 80, 70, 60, etc.

Homework will be due at the beginning of class on the assigned date. Most homework problems will be assigned from the text. You are encouraged to discuss with others in the class the homework problems, however, the discussion must end when you write your solution. Thus, the work on the paper must be your work. Late homework will be graded only if it arrives before the instructor gives the homework set to the grader, otherwise it will not count.

Attendance Policy: Attendance will not be taken. However, all students are responsible for all materials covered in class as well as all assignments made, due dates and any announcements. Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor.

WVU is committed to social justice. The instructor of this course concurs with WVU's commitment and expects to maintain a positive learning environment based upon open communication and mutual respect and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color, or national origin. Any suggestions as to how to further such a positive and open environment will be appreciated and given serious consideration.

If you are a person with disability and anticipate needing any type of accommodation in order to participate in this class, please advise us and make appropriate arrangements with Disability Services (293-6700).