Electrical Engineering Department

جامعة الملك فهد للبترول والمعادن
King Fahd University of Petroleum & Minerals

EE 201: Electric Circuits I
Second Semester, 2010/2011 (102)

Instructor:
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Office Hours:
S.M.W. 12:00 – 1:00PM

Webpage: http://faculty.kfupm.edu.sa/EE/zakiha

Course Website:
It is extremely important to keep checking the course page for updates, HW assignments and practice problem solutions, and announcements. Course website is at: WebCT

Course Content:
Basic laws: Ohm's, KVL, KCL. Resistive networks. Circuit analysis techniques: nodal and mesh analysis. Network theorems: Thevenin's, Norton's, source transformations, superposition, maximum power transfer. Energy storage elements. Phasor technique for steady-state sinusoidal response. Important power concepts of ac circuits. Transient analysis of first-order circuits.
Pre-requisite: MATH 102 and PHYS 102

Text:
Electric Circuits, James Nilsson and Susan Riedel, 8th edition, Prentice Hall, 2008.

Other Texts
Ref1: *Fundamentals of Electric Circuits,* Charles Alexander and Matthew Sadiku, McGraw Hill, 2004.
Ref2: *Engineering Circuit Analysis,* William Hayt and Jack Kemmerly, McGraw Hill, 2007.
Ref3: *Online Resources*, GOOGLE Search.

CAD tools: Homework problems and small projects will utilize the use of the student version of MULTISIM, the electronic circuit simulator.

Course Outcomes:
1) Apply knowledge of mathematics, science, and engineering to the analysis and design of electrical circuits.
2) Identify, formulate, and solve engineering problems in the area circuits and systems.
3) Use the techniques, skills, and modern engineering tools such as MULTISIM (Electronics workbench), necessary for engineering practice.
4) To function on multi-disciplinary teams through the electric circuits experiments and projects.
5) To design an electric system, components or process to meet desired needs within realistic constraints.

Grading Policy:

HW†:	**5%**
Quizzes:	**5%**
Small Project:	**5%**
Laboratory:	**20%**
Two Major Exams:	**30%**
Final:	**35%**

Tentative Schedule				
Week		Topic	Reading assignment	Experiments
1	12 Feb.	Circuits Variables, Sources, Power and Energy	1.1-1.6, 2.1	No Experiment
2	19 Feb.	Ohm's Law, KCL, KVL, Dependent Sources	2.2-2.5	Exp # 1 : Electrical circuits simulation using Multisim Electronics Workbench
3	26 Feb.	Resistive Circuits, Nodal Analysis	3.1-3.4,3.7, 4.1	Exp #2 : Electric circuit fundamentals
4	5 Mar.	Nodal Analysis (Continued), Mesh Analysis	4.2-4.5	Exp # 3 : Resistors in series, color codes & power rating
5	12 Mar.	Mesh Analysis, Source Transformation	4.6-4.9	Exp # 4 : Kirchhoff's laws
First Major Exam				
6	19 Mar.	Thevenin and Norton Equivalent Circuits	4.10-4.11	No Exp.
7	26 Mar.	Maximum Power Transfer, Superposition	4.12-4.13,5.1-5.2	Exp # 5 : Series & parallel circuits, voltage divider & current divider rules
8	2 Apr.	Operational Amplifiers	5.3-5.6	Exp # 6 : Superposition theorem
9 - 13 Apr.		SPRING BREAK		
9	16 Apr.	Inductors, Capacitors, First Order Circuits	6.1-6.3,7.1-7.2	Exp # 7 : Thevenin's theorem and maximum power transfer
10	23 Apr.	First Order Circuits (Continued)	7.3-7.7	Exp # 8 : DC sweep analysis
Second Major Exam				
11	30 Apr.	First Order Circuits, Sinusoidal Response, Complex Numbers .	9.1-9.2, App. B.	Exp # 9 : Transients of a first order RC circuit
12	7 May	Frequency Domain Analysis	9.3-9.7	Exp # 10 : The oscilloscope and function generator
13	14 May	Frequency Domain Analysis (continued)	9.8, 9.9, 9.12	Exp # 11 : Sinusoidal AC analysis
14	21 May	Average and Reactive Power, Complex Power	10.1-10.5	Final Lab Exam
15	28 May	Maximum Power Transfer	10.6	
† Homework and project are due on dates shown on the class website (WebCT). No Late submissions will be accepted.				

Important Points to Remember:

1. **Practice Problems:** Practice problems are to be solved completely by the students. Solutions will not be collected but it will be posted on the class website**.** Different assignments will be given as homework.

2. **Pre-Labs**: Each student must submit the pre-lab. Assignment at the beginning of each lab. (No pre-labs for the first two experiments). No pre-lab will be accepted for an experiment that has already started.

3. **Lab. Makeup:** No lab makeup will be allowed without an official excuse from students affairs.

4. **Attendance:** According to the university regulations, any student that exceeds 20% (9 lectures) of the scheduled class meeting without an official excuse will receive a grade of DN in the course.

5. **Official Excuses**: All official excuses must be submitted to the instructor no later than one week of the date of the official excuse. The instructor may not accept late excuses.

6. **Course Lectures:** Besides class discussions, you are supposed to READ YOUR BOOK. Some online lectures are available online through the *Open Courseware*. You are strongly encouraged to systematically review those online lectures to enhance your understanding of the course material.

Suggested Practice problems:

PP #01: 1.12, 1.13, 1.19, 1.26, 2.4

PP #02: 2.6, 2.12, 2.20, 2.25, 2.26

PP #03: 2.28, 2.29, 3.4, 3.7(c), 3.8

PP #04: 3.13, 4.3, 4.15, 4.19, 4.25, 4.27, 4.29

PP #05: 4.51, 4.52, 4.55, 4.56, 4.59

PP #06: 4.60, 4.63, 4.67, 4.68, 4.70

PP #07: 4.73, 4.75, 4.86, 4.88

PP #08: 5.2, 5.10, 5.13, 6.2, 6.4, 6.13

PP #09: 7.4, 7.10, 7.11, 7.21, 7.35

PP #10: 7.46, 7.47, 7.63, 7.84, 9.1, 9.6, 9.8