# King Fahd University Of Petroleum & Minerals
## Department of Electrical Engineering
## EE-204 Fundamentals of Electric Circuits
### 2012-2013 Second Semester (122)

| INSTRUCTOR | OFFICE | Sections | PHONE | E-MAIL | OFFICE HOURS |
|---|---|---|---|---|---|
| Dr. Oualid Hammi | 59 / 2087 | 7 and 8 | 7394 | ohammi@kfupm.edu.sa | SM: 10:00AM-11:00AM W: 2:00PM - 3:00PM |

Basic laws: Ohm's law, KVL, KCL. Resistive networks. Circuit analysis techniques: node-voltage and mesh-current. Network theorems. Inductance and capacitance. Sinusoidal analysis and phasor methods. Power concepts of AC circuits. Polyphase circuits.
Prerequisites: MATH 102 and PHYS 102

**Textbook**: Clayton Paul, *FUNDAMENTALS OF ELECTRIC CIRCUIT ANALYSIS*, Wiley & Sons. Inc., 2001.

### Tentative Schedule:

| Week | | Topic | Reading Assignment | Laboratory/Tutorial |
|---|---|---|---|---|
| 1 | 26 Jan. | Introduction, Basic Definitions, KCL, KVL | 1.2 – 1.6 | No Meeting |
| 2 | 2 Feb. | Conservation of power, Series & Parallel Connection of Elements, Ohm's Law | 1.7 – 1.8, 2.1 – 2.3 | Exp #1: An Introduction to Multisim |
| 3 | 9 Feb. | Resistors in Series and in Parallel, Voltage and Current Division | 2.4 – 2.6 | Exp #2 Resistors and Ohm's Law |
| 4 | 16 Feb. | Source Transformation, Principle of Superposition | 2.7, 3.1 | No Meeting |
| 5 | 23 Feb. | Thevenin Theorem, Norton Theorem | 3.2 – 3.3 | Problem Session # 1 |
| First Major Exam:  Wednesday 27 February 6:30-8:00PM | | | | |
| 6 | 2 Mar. | Maximum Power Transfer, Node Voltage Method | 3.4 – 3.5 | Exp #3: Kirchhoff's Laws |
| 7 | 9 Mar. | Node Voltage Method, Mesh Current Method | 3.5 (Cont.) – 3.6 | Exp #4: Current and Voltage Divider Rules |
| 8 | 16 Mar. | Capacitors, Inductors, Series and Parallel Connections | 5.1 – 5.2, 5.4 | Exp#5 Superposition Theorem |
| SPRING BREAK    23 March - 27 March | | | | |
| 9 | 30 Mar. | Sinusoidal Source, Complex Numbers, Frequency Domain (Phasor) Circuit. | 6.1 – 6.3 | Exp #6: Thevenin / Norton Theorems and Maximum Power Transfer |
| 10 | 6 Apr. | Frequency Domain Analysis | 6.4 – 6.5 | Problem Session # 2 |
| Second Major Exam: Saturday 13 April 6:30-8:00PM | | | | |
| 11 | 13 Apr. | Power Concepts, Average Power | 6.6 | Exp # 7: The Oscilloscope and Function Generator |
| 12 | 20 Apr. | Power Factor, RMS Values | 6.6 | Exp #8: Frequency Domain Analysis |
| 13 | 27 Apr. | Commercial Power Distribution, Three Phase Circuits | 6.9 | Exp #9: Maximum Power Transfer |
| 14 | 4 May | Three Phase Circuits, Star-Delta Connections | 6.9 | Exp #10: Average and RMS Values |
| 15 | 11 May | Review | | Final Lab Exam |
| Final Exam: Sunday 26 May  12:30 PM | | | | |

**Grade Distribution:**

| Class work* | Major I** | Major II** | Laboratory | Final Exam |
|---|---|---|---|---|
| **15 %** | **15 %** | **15 %** | **20 %** | **35 %** |

** *Location of major exams will be reserved and posted by each instructor.*

## Course Outcomes

Upon the successful completion of this course, you should be able to

1.          Apply knowledge of mathematics, science, and engineering to the analysis and design of electric circuits.
2.          Identify, formulate, and solve engineering problems in the area of circuits.
3.          Use the techniques, skills, and modern programming tools such as PSPICE, necessary for engineering practice.
4.          Participate and function within multi-disciplinary teams.
5.          Design a system to meet desired needs within realistic constraints.

## Practice problems:

| HW # 1 | Ch. 1: | 1.3-1, 1.4-5, 1.5-5, 1.6-2, 1.6-6, 1.7-2, 1.8-2 |
|---|---|---|
| HW # 2 | Ch. 2: | 2.2-5, 2.2-7, 2.3-2, 2.3-8, 2.4-3, 2.4-10, 2.5-7, 2.5-11 |
| HW # 3 | Ch. 2: | Ch.2: 2.6-4, 2.7-3, 2.7-5, |
| HW # 4 | Ch. 3: | 3.2-6, 3.2-12, 3.3-2, 3.3-4, 3.3-6, 3.3-12 |
| HW # 5 | Ch. 3: | 3.5-2, 3.5-7, 3.6-2, 3.6-7 |
| HW # 6 | Ch. 5: | 5.1-3, 5.1-6, 5.1-8, 5.2-3, 5.2-6, 5.2-8, 5.4-2 |
| HW # 7 | Ch. 6: | 6.1-1(b,f), 6.1-2(a,f,g), 6.2-1(d,f), 6.2-5(b,d) |
| HW # 8 | Ch. 6: | 6.3-4, 6.3-7, 6.4-4, 6.4-7, 6.4-12 |
| HW # 9 | Ch. 6: | 6.4-16, 6.4-17, 6.5-1, 6.5-4, 6.5-8 |
| HW # 10 | Ch. 6: | 6.6-1, 6.6-5, 6.6-14, 6.6-17, 6.6-21, 6.9-4 |

## Important Points to Remember

1. **Practice Problems:** Practice problems are to be solved completely by the students and **not to be submitted**. Solutions will be posted in **Blackboard CE.**

2. **Homework :** Each instructor will assign his homework as scheduled

3. **Quizzes:** Each instructor prepares his quizzes as scheduled.

4. **Problem Sessions**: All problem sessions will be held during the lab periods by the lab instructors.

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

6. **Attendance:** According to the university regulations, any student that exceeds 20% (6 lectures) of the scheduled class meeting without an official excuse will receive a grade of DN in the course (including lab sessions).

7. **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.