



## A. Basic Information

**Course Title:** Electric circuits

**Code:** EPE 211

**Lecture:** 4

**Tutorial:** 2

**Practical:** -

**Total:** 6

**Program on which the course is given:** B.Sc. Electrical Engineering (Electrical Power and machines)

**Major or minor element of program:** N.A.

**Department offering the program:** Electrical Engineering Department

**Department offering the course:** Electrical Engineering Department

**Academic year / level:** Second Year / First Semester

**Date of specifications approval:** 10/5/2006

## B. Professional Information

### 1. Overall aims of course

By the end of the course the students will be able to:

- Understanding the methods of analysis of ac networks and how to calculate the power components and how to improve the power factor.
- Understanding the resonant conditions in ac networks
- Understanding the analysis of three phase systems and how to measure the power in these systems
- Analyze the transient circuits under different types of voltages
- Understanding the term harmonics and how to analyze 1-phase circuits containing harmonic

### 2. Intended Learning outcomes of Course (ILOs)

#### a. Knowledge and Understanding:

- a.1) Concepts and theories of mathematics and sciences, appropriate to the circuit analysis.
- a.3) Characteristics of engineering materials related to the circuit analysis.



a.5) Methodologies of solving engineering problems, data collection, and interpretation.

**b. Intellectual Skills**

- b.1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
- b.2) Select appropriate solutions for engineering problems based on analytical thinking.
- b.3) Think in a creative and innovative way in problem solving and design.
- b.5) Assess and evaluate the characteristics and performance of components, systems and processes.
- b.11) Analyze results of numerical models and assess their limitations.
- b.14) Analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical power and machines.

**c. Professional and Practical Skills**

- c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems.
- c.5) Use computational facilities, measuring instruments, workshops and laboratories equipment to design experiments and collect, analyze and interpret results.
- c.6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
- c.7) Apply numerical modeling methods to engineering problems.

**d. General and Transferable Skills**

- d.1) Collaborate effectively within multidisciplinary team.
- d.2) Work in stressful environment and within constraints.
- d.3) Communicate effectively.



## 3. Contents

No	Topic	No. of hours	ILOs	Teaching / learning methods and strategies	Assessment method
1	Sinusoids and Phasors	6	a1, b1, c1	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
2	Sinusoids and Phasors	6	a1, b1, c1	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
3	Sinusoidal steady-State Analysis	6	a1, a5, b1, b11,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
4	Sinusoidal steady-State Analysis	6	a1, a5, b1, b11,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
5	AC Power Analysis	6	a1, a5, b1, b2, b3, b5, b14, c5, c7, d1, d2, d3	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
6	AC Power Analysis	6	a1, a5, b1, b2, b3, b5, b14, c5, c7, d1, d2, d3	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
7	Three Phase Circuits	6	a3, a5, b1, b2, b3, b5, b11, b14, c5, d2	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
8	Mid term exam				
9	Three Phase Circuits	6	a3, a5, b1, b2, b3,	Lectures, Practical training /	Home Assignments,



			b5, b11, b14,c5, d2	laboratory, Class activity, Case study, Assignments / homework	Quizzes, Oral Exam
10	Transient Response of Circuits	6	a1, a5, b11, c6,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
11	Transient Response of Circuits	6	a1, a5, b11, c6,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
12	Fourier Analysis and Circuit Applications	6	a1, b1, b2,b3, c6, , c7,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
13	Fourier Analysis and Circuit Applications	6	a1, b1, b2,b3, c6, , c7,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
14	Two-port Circuits	6	a5, c1,	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
15	Final exam				
16					

**4. Teaching and Learning Methods**

Lectures  
 Practical training / laboratory  
 Class activity  
 Case study  
 Assignments / homework

**5. Student Assessment Methods**



Assignments to assess knowledge, intellectual skills and professional and practical skills.  
Quiz to assess knowledge, intellectual skills and professional and practical skills.  
Mid-term exam to assess knowledge, intellectual skills and professional and practical skills.  
Oral exam to assess professional, practical, general and transferable skills.  
Final exam to assess knowledge, intellectual skills and professional and practical skills.

**6. Assessment schedule**

Assessment 1 on weeks 2, 5, 9, 11  
Assessment 2 Quizzes on weeks 4, 6, 10, 12  
Assessment 3 Mid-term exam on week 8  
Assessment 4 Oral Exam on week 14  
Assessment 5 Final exam on week 15

**7. Weighting of Assessments**

Mid- Term Examination	05%
Final- Term Examination	05%
Oral Examination	10%
Semester Work	20%
<u>Other</u>	<u>60%</u>
Total	100%

**8. List of References**

8.1 Course Notes

- Handouts prepared by the instructor.

8.2 Essential Books (Text Books)

- Mahmood Nahvi, "Electric Circuits", 4th edition, Schaum's Outlines, Joseph A. Edminister, Mc Graw Hill, 2003.
- James W. Nilsson and Susan A. Riedel, "Electric Circuits", Prentice Hall, New Jersey



8.3 Recommended Books

- Allan Robbins and Wilhelm miller, “Circuit Analysis; Theory and practice”, 4th Edition, Delamr Learning, 2007.
- “Electrical Theory and Technology”, Jhon Bird, Newnes, Elsevier, Oxford, 2001.

**9. Facilities Required for Teaching and learning**

Presentation board

Computer and data show

**Course coordinator:** Prof. Dr. Mousa Abd-Allah

**Course instructor:** Prof. Dr. Mousa Abd-Allah, Dr. Mohamed Eisa

**Head of department:** Prof. Dr. Mousa Abd-Allah

**Date:** 22 / 11 / 2011