A. Basic Information

Course Title: Principles of Electrical Engineering   **Code**: EPE111
Lecture: 4   **Tutorial**: 2   **Practical**: -   **Total:** 6
Program on which the course is given: B.Sc. Electrical Engineering (Power)
Major or minor element of program: Major
Department offering the program: Electrical Engineering Department
Department offering the course: Electrical Engineering Department
Academic year / level: **First** 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:

1- Understand the concepts and the principles of the basic theorems.
2- Understand the principles of electromagnetism and electrostatics.
3- Understand the different techniques and network theorems for network analysis in D.C. & A.C. current.
4- Carry out the electric solutions of the different electric circuits.
5- Analyze the behaviour of the electrical networks in D.C. & A.C. currents.

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

a. **Knowledge and Understanding:**

   a.1) Concepts and theories of mathematics and sciences, appropriate to the discipline.

a.3) Characteristics of engineering materials related to discipline.
a.5) Methodologies of solving engineering problems, data collection interpretation.
a.15) Principles of operation and performance specifications of electrical and electromechanical engineering systems.
a.17) Basic electrical power system theory.

b. Intellectual Skills

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.6) Investigate the failure of components, systems, and processes

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.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, product and/or services.
c.5) Use computational facilities and techniques, measuring instruments, workshops   and laboratories equipment to design experiments, 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.

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e. General and Transferable Skills

d.2) Work in stressful environment and within constraints.
d.7) Search for information and engage in life-long self learning discipline.

3. **Contents**

No	Topic	No. of hours	ILOs	Teaching / learning methods and strategies	Assessment method
1	Units, charge, current voltage, power and Energy, Ohm's Law, network elements, series and parallel resistances, temperature effect and linear and non-linear resistances.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activitity homework	Assignments, Quizzes, Mid-term exam Final exam
2	Units, charge, current voltage, power and Energy, Ohm's Law, network elements, series and parallel resistances, temperature effect and linear and non-linear resistances.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activitity homework	Assignments, Quizzes, Mid-term exam Final exam
3	Kirrchhof's Laws, Loop and Node methods, Delta-Star transformations.Network Theorems (Superposition, Thevenin, Norton, Maxwell and Maximum power transferred).	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
4	Kirrchhof's Laws, Loop and Node methods, Delta-Star transformations.Network Theorems (Superposition, Thevenin, Norton, Maxwell and Maximum power transferred).	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
5	Alternating current, generation, definitions,		a.1, a.3, a.5, a.15, a.17	Lectures	

	average, maximum and R.M.S. values, form factors, phase difference, R-LC circuits, phasor diagrams.	6	b.2, b.3, b.6 c.1, c.2, d.7	Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
6	Alternating current, generation, definitions, average, maximum and R.M.S. values, form factors, phase difference, R-LC circuits, phasor diagrams.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3, b.6 c.1, c.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
7	Active, reactive and apparent Power, Power factor correction, Power triangle, Series and parallel resonance, Quality factor, Half power points.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3, b.6 c.1, c.2, d.2, d.7	Lectures Class activity homework	Assignments, Quizzes, Mid-term exam Final exam
8	Magnetic field intensity and density, electromagnetism, Lenz's Law, Farady's Law, Force between parallel conductors.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activity homework	Assignments, Quizzes, Mid-term exam Final exam
9	Magnetic field intensity and density, electromagnetism, Lenz's Law, Farady's Law, Force between parallel conductors.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activity homework	Assignments, Quizzes, Mid-term exam Final exam
10	Magnetic circuits, Magnetic losses, Self and mutual inductances, coupling coefficient, stray inductance, Inductance in D.C. current.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2,	Lectures Class activity homework	Assignments, Quizzes, Mid-

			d.7		term exam Final exam
11	Magnetic circuits, Magnetic losses, Self and mutual inductances, coupling coefficient, stray inductance, Inductance in D.C. current.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.7	Lectures Class activity homework	Assignments, Quizzes, Mid-term exam Final exam
12	Electrostatics, Electric field, Coulomb's Law, Electric potential, equipotential surfaces, potential gradient, Capacitors, Charging and discharging of capacitors, Stray capacitance, capacitance in D.C current, Fundamentals of Power Electronics.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
13	Electrostatics, Electric field, Coulomb's Law, Electric potential, equipotential surfaces, potential gradient, Capacitors, Charging and discharging of capacitors, Stray capacitance, capacitance in D.C current, Fundamentals of Power Electronics.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
14	Electrostatics, Electric field, Coulomb's Law, Electric potential, equipotential surfaces, potential gradient, Capacitors, Charging and discharging of capacitors, Stray capacitance, capacitance in D.C current, Fundamentals of Power Electronics.	6	a.1, a.3, a.5, a.15, a.17 b.2, b.3 c.1, c.2, d.2, d.7	Lectures Class activity Case study homework	Assignments, Quizzes, Mid-term exam Final exam
	Final exam				

4. Teaching and Learning Methods
_____ Lectures
_____ Class activity
_____ Case study
_____ Assignments / homework
Other :_____

5. Student Assessment Methods
1- Assignments to assess knowledge and intellectual skills.
2- Quiz to assess knowledge, intellectual and professional skills.
3- Mid-term exam to assess knowledge, intellectual, professional and general skills.
4- Final exam to assess knowledge, intellectual, professional and general skills.

5- Assessment schedule
Assessment 1 on weeks 3, 5,7, 10, 12, 13
Assessment 2 Quizzes on weeks 2, 4, 6, 9, 11, 14
Assessment 3 Mid-term exam on week 8
Assessment 5 Final exam on week 15

6- Weighting of Assessments
05% Home assignments
05% Quizzes
23.33% Mid-term examination
0% Oral examination
66.67% Final-term examination
100% Total

7- List of References

Course notes

- Course notes prepared by instructor.Prof. Dr. Mohamed Moenes, Prof. Dr Nagat Abdel-Gawad .

Essential books

#NAME?

Recommended books

(i)   David Bell, Fundamentals of Electric Circuits,, Prentice/Hall International Editions, 1981

(ii)   David E. Johnson, Johnny R. Johnson, John L. Hilburn, Electric Circuit Analysis, 2 nd Edition.

- en.wikipedia.org/wiki

- www.allaboutcircuits.com/vol_1/

- www.answers.com/topic

- www.wisc-online.com/objects

- www. absoluteastronomy.com/topics

9- Facilities required for teaching and learning

Lecture room equipped with overhead projector

Presentation board, computer and data show

Course coordinator: Dr. Prof. Dr. Mohamed Moenes M. Salama, Prof. Dr Nagat Abdel-Gawad .

Course instructor: Dr. Prof. Dr. Mohamed Moenes M. Salama

Head of Department: Prof. Dr. MousaA. Abd-Allah   **Date:** March 20, 2012