



Shoubra
Faculty of
Engineering

Model No.12

Course Specifications : Principles of Electrical Engineering

Alfarabi for Quality Assurance and Accreditation System - at 16/2/2014 4:57 PM

University : Benha university

Faculty : Shoubra Faculty of Engineering

Department : Electrical Engineering Department

1- Course Data

Course Code : EPE111

Course Title : Principles of Electrical Engineering

Specialization :

Study Year : First Year

Teaching Hours:

Lecture : 4

Tutorial : 2

Practical :

Date of specifications approval: 20/6/2010

2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- Demonstrate the concepts and the principles of the basic theorems.
- 2.2- Demonstrate the principles of electromagnetism and electrostatics.
- 2.3- Demonstrate the different techniques and network theorems for network analysis in D.C. & A.C. current.
- 2.4- Use the electric solutions of the different electric circuits.
- 2.5- Analyze the behavior of the electrical networks in D.C. & A.C. currents.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 - a.1) Demonstrate Concepts and theories of electromagnetism and electrostatics.
- a- 2 - a.2) Demonstrate the different techniques and network theorems for network analysis in D.C. & A.C. current.
- a- 3 - a.3) Apply Methodologies of solving solutions of the different electric circuits.
- a- 4 - a.4) Illustrate Principles of operation and performance specifications of the behavior of the electrical networks in D.C. & A.C. currents.
- a- 5 - a.5) Describe Basic electrical power system theory.

b- Intellectual Skills

At the end of this course, the students will be able to:

- b- 1 - b.1) Apply appropriate solutions for engineering problems based on analytical thinking.
- b- 2 - b.2) Differentiate a creative and innovative way in problem solving and design.
- b- 3 - b.3) Illustrate the failure of components, systems, and processes.

c- Professional Skills

On completing this course, the students are expected to be able to:

- c- 1 - c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems.
- c- 2 - c.2) Recognize professionally merge the engineering knowledge, understanding, and feedback to improve design, product and/or services.
- c- 3 - c.3) Use computational facilities and techniques, measuring instruments, workshops and laboratory to design experiments, collect, analyze, and interpret results.

c- 4 - c.4) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.

4- Course Contents

No.	Topics	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.	12	a.1, a.2, a.3, a.4, a.5, b.1, b.2, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
2	Kirchhoff's Laws, Loop and Node methods, Delta-Star transformations. Network Theorems (Superposition, Thevenin, Norton, Maxwell and Maximum power transferred).	12	a.1, a.2, a.3, a.4, a.5, b.1, b.2, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
3	Alternating current, generation, definitions, average, maximum and R.M.S. values, form factors, phase difference, R-LC circuits, phasor diagrams.	12	a.1, a.2, a.3, a.4, a.5, b.1, b.2, b.3, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
4	Active, reactive and apparent Power, Power factor correction, Power triangle, Series and parallel resonance, Quality factor, Half power points.	6	a.1, a.2, a.3, a.4, a.5, b.1, b.2, b.3, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
5	Magnetic field intensity and density, electromagnetism, Lenz's Law, Farady's Law, Force between parallel conductors.	12	a.1, a.2, a.3, a.4, a.5, b.1, b.2, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
6	Magnetic circuits, Magnetic losses, Self and mutual inductances, coupling coefficient, stray inductance, Inductance in D.C. current.	12	a.1, a.2, a.3, a.4, a.5, b.1, b.2, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
7	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.	18	a.1, a.2, a.3, a.4, a.5, b.1, b.2, c.1, c.2, c.3, c.4	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam

5- Teaching and Learning Methods

- 5.1- Modified Lectures
- 5.2- Class activity
- 5.3- Case study
- 5.4- Assignments / homework

6- Teaching and Learning Methods of Disables

None

7- Student Assessment

a- Student Assessment Methods

1	• Assignments to assess • knowledge and intellectual skills.
2	• Quiz to assess • knowledge and intellectual skills.
3	• Mid-term exam to assess • knowledge and intellectual skills.
4	• Final exam to assess • knowledge and intellectual skills.

b- Assessment Schedule

No.	Assessment	Week
1	• Assignments	weeks 5, 10, 12, 13
2	Quizzes	weeks 3, 5, 9, 11
3	Mid-term exam	7
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	23.33 %
Final_Term Examination	66.67 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	10 %
Other types of assessment	0 %
Total	100 %

8- List of References

a- Course Notes

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

b- Recommended Books

- 1- 1. Joseph A. Eminister, " Electric Circuits ", Schaum's outline series, McGraw- Hill Book Company , Singapore 1983.
- 2- 2. H. Cotton, " Applied Electricity "
- 3- 3. Robert L. Boylestad, "Introductory Circuit Analysis ", 9th Edition, Prentice Hall
- 4- 4. A. M. Howatson, " Electrical Circuits and Systems ", An introduction for engineers and physical scientists.
- 5- 5. Chales I Hubert, " Electric Circuits AC/DC ", An Integrated Approach, International Student Edition.
- 6- 7. Syed A Nasar, " Electric Circuits ", Book 2, University of Kentucky, McGraw – Hill Book Company.
- 7- (i) David Bell, Fundamentals of Electric Circuits,, Prentice/Hall International Editions, 1981
- 8- (ii) David E. Johnson, Johnny R. Johnson, John L. Hilburn, Electric Circuit Analysis, 2 nd Edition.

c- Web Sites

- 1- - en.wikipedia.org/wiki
- 2- - www.allaboutcircuits.com/vol_1/

- 3- www.answers.com/topic
 4- www.wisc-online.com/objects
 5- www.absoluteastronomy.com/topics

- Course Coordinator :

- 1 - Mohamed Moenes Mohamed Salama
 2 – نجاه محمد كامل عبد الجواد

Matrix of Knowledge and Skills of the course

No.	Topics	No. of hours	Basic Knowledge	Intellectual Skills	Professional Skills
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.	12	a.1, a.2, a.3, a.4, a.5	b.1, b.2	c.1, c.2, c.3, c.4
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4	Active, reactive and apparent Power, Power factor correction, Power triangle, Series and parallel resonance, Quality factor, Half power points.	6	a.1, a.2, a.3, a.4, a.5	b.1, b.2, b.3	c.1, c.2, c.3, c.4
5	Magnetic field intensity and density, electromagnetism, Lenz's Law, Faraday's Law, Force between parallel conductors.	12	a.1, a.2, a.3, a.4, a.5	b.1, b.2	c.1, c.2, c.3, c.4
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Matrix of course aims and ILO's

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Lecture : 4

Tutorial : 2

Practical :

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Course Aims	ILO a's					ILO b's			ILO c's			
	1	2	3	4	5	1	2	3	1	2	3	4
Understand the concepts and the principles of the basic theorems				✓	✓			✓	✓	✓	✓	
Understand the principles of electromagnetism and electrostatics.	✓	✓	✓			✓	✓	✓	✓	✓		
Understand the different techniques and network theorems for network analysis in D.C. & A.C. current				✓	✓			✓	✓	✓	✓	
Carry out the electric solutions of the different electric circuits	✓		✓		✓		✓		✓		✓	
Analyze the behavior of the electrical networks in D.C. & A.C. currents.		✓		✓		✓		✓		✓		

Head of department: Prof. Dr. Sayed A. Ward