



COURSE SPECIFICATIONS (2011-2012)

Benha University Faculty of Engineering at Shobra Electrical Engineering Department

A- Basic Information

Course Title: Computer Applications in Electric Power and Machines **Code:** EPE324
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: **Third Year / Second Semester**
Date of specifications approval: 10/5/2006

B- Professional Information

1- Overall aims of course:

Write the aims of the course here ...

The mission of the Computer Applications in Electric Power and Machines program is to provide students with a broad and thorough education Computer Applications in Electric Power and Machines engineering fundamentals, applications, and design so as to prepare graduates for the practice of Computer Applications in Electric Power and Machines engineering at the professional level with confidence and skills necessary to meet the technical and social challenges of the future and for continuing their studies at the graduate level.

In pursuit of this mission, the educational objectives of the Computer Applications in Electric Power and Machines program are:

To provide a broadly based educational experience in which the essential scientific and technical elements of the engineering curriculum are integrated with the humanities and social sciences to prepare students with competencies needed for personal enrichments, career development, and lifelong learning.

To ensure that the graduates have an understanding of the highest standards of personal and professional integrity, and ethical responsibility in the practice of Computer Applications in Electric Power and Machines engineering.

To ensure that the graduates are well trained in several areas of Computer Applications in Electric Power and Machines engineering, such as analysis and design of Computer Applications in Electric Power and Machines systems and are able to identify, formulate, and solve a wide range of Computer Applications in Electric Power and Machines engineering problems using modern engineering tools and techniques.

To provide students with a major design experience involving a team approach and alternate solutions, and incorporating realistic constraints that include economic, environmental, ethical, safety, social, and political considerations.

2- Intended learning outcomes of course (ILOs)

By completion of the course, the student should be able to:

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.



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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.4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
- b.5) Assess and evaluate the characteristics and performance 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.

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
- d.5) Lead and motivate individuals.
- d.6) Effectively manage tasks, time, and resources.

3- Contents

No.	Topic	No. of hours	ILO's	Teaching/ learning methods and strategies	Assessment method
1	Numerical solution of ordinary differential equations using Matlab	6	a1, a3, a5, c5, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
2	Numerical solution of ordinary differential equations using Matlab	6	a1, a3, a5, c5, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
3	Simulation of the behavior of various power electronics converters	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments /	Home Assignments, Quizzes, Oral Exam



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				homework	
4	Simulation of the behavior of various power electronics converters	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
5	Simulation of the steady-state behavior of various 3-phase transformers	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
6	Simulation of the steady-state behavior of various 3-phase transformers	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
7	Simulation of the steady-state behavior of various 3-phase Induction motors	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
8	Mid term exam				
9	Simulation of the steady-state behavior of various 3-phase Induction motors	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
10	Simulation of power system loads and load factor.	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
11	Simulation of power system loads and load factor.	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments /	Home Assignments, Quizzes, Oral Exam



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				homework	
12	Simulation and modeling and performance of power transmission lines.	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
13	Simulation and modeling and performance of power transmission lines.	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	Lectures, Practical training / laboratory, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
14	Simulation of load flow analysis	6	a1, a3, a5, b1, b2, b3, b4, b5 c1,c2, c5, c6, d1, d2, d3, d5, d6	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
 Seminar / workshop
 Class activity
 Case study
 Assignments / homework

5- Student Assessment Methods

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

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



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Weighting of Assessments

- 05% Home assignments
- 05% Quizzes
- 10% Mid-term examination
- 20% Oral examination
- 60% Final-term examination
- 100% Total

6- List of References

Course notes

Course notes prepared by instructor.

Essential books

- (i) D. W. Hart, Introduction to power electronics, John Wiley sons, 1997.
- (ii) P.C Sen, Principles of Electric Machines & Power Electronics, John Wiley sons, 1997
- (a) S. J. Chapman, Electric Machinery Fundamentals, Fourth edition, McGraw-Hill, 2005.
- (b) A

Recommended books

- (i) The MathWorks Corporation: <http://www.mathworks.com/>
- (ii) Interactive Power Electronics Seminar by Swiss Federal Institute of Technology Zurich: http://www.ipes.ethz.ch/ipes/e_index.html
- (iii) Interactive Power Electronics online text by University of Technology Sydney, Australia http://services.eng.uts.edu.au/~venkat/pe_html/contents.htm
- (iv) Interactive Power Electronics Online Course by Power Designers, USA http://www.powerdesigners.com/InfoWeb/resources/pe_html/contents.htm
- (v) European Power Electronics and Drives Association: <http://www.epeec.ethz.ch/>

7- Facilities required for teaching and learning

Lecture room equipped with overhead projector

Presentation board, computer and data show

Laboratory

Course coordinator: Dr. Omar Elsayed + Dr. Mahmoud Elsayed

Course instructor: Dr. Omar Elsayed + Dr. Mahmoud Elsayed

Head of Department: Prof. Dr. Mousa Abd-Allah

Date: March 20, 2012