

Course Specifications (2011 - 2012)

A. Basic Information

Course Title	Mathematics (3-B)			Course Code:	EMP 282		
Lecture:	3	Tutorial:	2	Practical	0	Total	5
Programme (s) on which this course is given:	B.Sc. Electrical Engineering						
Major or minor element of program:	Major						
Department offering the program:	Electrical Engineering						
Department offering the course:	Engineering Mathematics Physics						
Academic Year of program:	Second		Level of program:	Second Semester			
Date of specifications approval:	16/3/2010						

B. Professional Information

1. Overall aims of course

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

- To provide the students essential information and fundamentals of Numerical Analysis and their applications in engineering.
- To apply mathematical techniques for modeling, solving and analyzing real problems

2. Intended Learning outcomes of Course (ILOs)

a. Knowledge and Understanding:

- a1. Recognize Concepts and theories of mathematics and sciences, appropriate to the discipline.
- a5. Recognize Methodologies of solving engineering problems.

b. Intellectual Skills

- b1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
- b2. Select appropriate solutions for engineering problems based on analytical thinking.
- b7. Solve engineering problems, often on the basis of limited and possibly contradicting information;

c. Professional and Practical Skills

- c1. Apply knowledge of mathematics, science, information technology, design, business context and engineering
- c7. Apply numerical modeling methods to engineering problems.

d. General and Transferable Skills

d1.Collaborate effectively within multidisciplinary team.

d5.Lead and motivate individuals.

3. Contents

Week #	Topics	No. of Hours	ILOS	Teaching / learning methods and	Assessment method
1	Numerical Analysis: (Introduction) Methods for solving equations one variable	3	a1	Lectures	Assignments
			b2	Lectures	
			c7	Class activity	
2	Curve Fitting	3	a1	Lectures	Assignments
			b2	Class activity	
			c7	Class activity	
3	Interpolation, Finite differences, Divided differences, Lagrange's polynomials	3	a1	Lectures	Assignments
			b2	Class activity	
			c7		
4	Inverse Interpolation	3	a1	Lectures	Assignments
			b2	Class activity	
			c7		
5	Numerical Differentiation and Numerical Integration	3	a1	Lectures	Assignments
			b2	Class activity	
			c7		
6	Methods for solving ordinary differential equations	3	a1	Lectures	Assignments
			b2	Class activity	
			c7		
7	Advanced Matrices, Properties of symmetric matrices	3		Lectures	Assignments
			b1	Class activity	
			c1		
			d1		

8	Mid-term Exam	1	a1,a5		
			b1,b2,b7		
9	Positive and negative definite matrices, Quadratic forms	3		Lectures	Assignments
			b1	Class activity	
			c1		
10	Functions of matrices, Methods for linear systems	3	d1		
				Lectures	Assignments
			b1	Class activity	
11	First order partial differential equations	3	c1		
			d1		
			a5	Lectures	Assignments
12	Second order partial differential equations	3		Class activity	
			d5		
			a5	Lectures	Assignments
13	Wave Equation	3		Class activity	
			d5		
			a5	Lectures	Assignments
14	Laplace equation and Poisson equation	3		Class activity	
			d5		
			a5	Lectures	Assignments
15	Final Exam	3			
			a1,a5		
			b1,b2,b7		
Total		43			

4- Teaching and Learning Methods:

Check using the symbol \checkmark

\checkmark	Lectures
	Practical training / laboratory
	Seminar / workshop
\checkmark	Class activity
	Case study
	Project work
\checkmark	Tutorial
	Computer based work
	Other :

5- Student Assessment Methods:

Check using the symbol \checkmark

\checkmark	Assignments	to assess
	Quiz	to assess
\checkmark	Mid-term exam	to assess
	Oral exam	to assess
\checkmark	Final exam	to assess
	Design Project	to assess
	Report	to assess
	Experimental write up	to assess
	Informally assessment	to assess
	Other	to assess

a1,a5	b1,b2	c1,c7	d5
a1,a5	b1,b2,b7		
a1,a5	b1,b2,b7	c1	

6. Assessment schedule

- Assessment 1 Assignments on weeks
- Assessment 2 Quizzes on weeks
- Assessment 3 Mid-term exam on week
- Assessment 4 Oral Exam on week
- Assessment 5 Final exam on week
- Assessment 6 Design Project on weeks
- Assessment 7 Report on weeks
- Assessment 8 Experimental write up on weeks
- Assessment 9 Informally assessment

All
8
15

7. Weighting of Assessments

Assignments	16%
Quiz	
Mid-term exam	20%
Oral exam	
Final exam	64%
Design Project	
Report	
Experimental write up	
Informally assessment	
Other	
Total	100%

8. List of References

8.1 Course Notes

Lecture In Mathematics. (Numerical Analysis), Mohamed Husien Eid, 2011.

8.2 Essential Books (Text Books)

- Engineering Mathematics, Fifth Edition, K. A. Stroud, Industrial Press. Inc., New York 2001.

8.3 Recommended Books

- Advanced Engineering Mathematics, E. Kreyszig, John Wiley and Sons, New York 1999

8.4 Periodicals Web sites, etc

www.MathematicsResearch.com

9. Facilities Required for Teaching and learning

Data show, Overhead Projector, White board, prepared notes, Sheets and solving

Course Coordinator:

Dr. Mohamed Hussein Mohamed Mohamed Eid

Course instructor:

Dr. Mohamed Hussein Mohamed Mohamed Eid

Head of department:

Associate Prof. Ahmed Mohamed Abdullah Hayawar

Signature:

Date:

D	M	Y
1	2	2012