Course Specifications   (2011 - 2012)

A. Basic Information

Course Title	Mathematics (2-B)			Course Code:	EMP 173	
Lecture:	4	Tutorial:	2	Practical	0	Total	6

Programme (s) on which this course is given:	B.Sc. Electrical Engineering (Power)
Major or minor element of program:	Major
Department offering the program:	Electrical Engineering
Department offering the course:	Engineering Mathematics Physics

Academic Year of program:	First	Level of program:	Second Semester
Date of specifications approval:	Tuesday, March 16, 2010		

B. Professional Information

1. Overall aims of course
By the end of the course the students will be able to:

- **Recognize the essential information as introduction about Advanced Calculus and their applications in Engineering.**
- **Recognize the basic concepts and properties of some special functions.**
- **Solve the ordinary differential equations via power series.**
- **Recognize the basic concepts about Laplace Transformations and Inverse Laplace.**
- **Solve differential equations via Laplace transformations.**
- **Solve Partial Differential Equations.**
- **Interpret the methods of solution of Linear System of differential equations.**
- **Recognize the technology of using all the above items**

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.
d7.	Search for information and engage in life-long self learning discipline.

3. Contents

Week #	Topics	No. of Hours	ILOS	Teaching / learning methods and	Assessment method
1	* Introduction PowerSeries solution of ordinary differential equations	4	a1 c7	Lectures Class activity	
2	Series solution of ordinary differential equations	4	a1 c7	Lectures Class activity	
3	Gamma and Beta functions	4	a5 b1	Lectures Class activity	Assignments
4	Legendre's polynomials	4	a5 b1	Lectures Class activity	

5	**Bessel's functions**	**4**	a5	**Lectures**	**Assignments**
			b1	**Class activity**	
6	**Laplace transformations**	**4**	a1	**Lectures**	
			b7	**Class activity**	
			c1		
7	**Theorems and Properties of Laplace transformations**	**4**	a1	**Lectures**	**Assignments**
			b7	**Class activity**	
			c1		
8	Mid-term Exam	**1**	a1,a5		**Mid-term exam**
			b1,b2,b7		**Mid-term exam**
9	**Inverse Laplace transformations**	**4**	b2	**Class activity**	
			d5		
10	**Solving differential equations by Laplace transformations**	**4**	a1	**Lectures**	
			b1	**Class activity**	
11	**Partial differential equations First order differential partial quations**	**4**	a1	**Lectures**	**Assignments**
			b1	**Class activity**	
12	**Second order partial differential equations**	**4**	a5	**Lectures**	
				Class activity	
			c7		

13	**Heat and wave equations**	**4**	a5	**Lectures**	
				Class activity	
			c7		
14	**Systems of linear ordinary differential equations**	**4**	a1	**Lectures**	
			d1, d5, d7	**Class activity**	**Assignments**
15	Final Exam	**3**	a1,a5		**Final exam**
			b1,b2,b7		**Final exam**
			c1		**Final exam**
Total		**56**			

4- Teaching and Learning Methods:

Check using the symbol   √

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

5- Student Assessment Methods:
Check using the symbol √

√	Assignments	to assess	a1, a5	b1,b2,b7	c1,c7	d1, d5, d7
	Quiz	to assess				
√	Mid-term exam	to assess	a1,a5	b1,b2,b7		
	Oral exam	to assess				
√	Final exam	to assess	a1,a5	b1,b2,b7	c1	
	Design Project	to assess				
	Report	to assess				
	Experimental write up	to assess				
	Informally assessment	to assess				
	Other	to assess				

6. Assessment schedule

Assessment 1 Assignments on weeks	3,5,7,9,11
Assessment 2 Quizzes on weeks	
Assessment 3 Mid-term exam on week	8
Assessment 4 Oral Exam on week	
Assessment 5 Final exam on week	15
Assessment 6 Design Project on weeks	
Assessment 7 Report on weeks	
Assessment 8 Experimental write up on weeks	
Assessment 9 Informally assessment	

7. Weighting of Assessments

Assignments	13%
Quiz	
Mid-term exam	20%
Oral exam	
Final exam	67%
Design Project	
Report	
Experimental write up	
Informally assessment	
Other	
Total	100%

8. List of References

8.1 Course Notes

• Lecture In Mathematics, Part II, Mohamed Husien Eid, 2001

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

White board, prepared notes, Sheets and solving problems.

Course Coordinator:	Dr. Mohamed Hussein Mohamed Mohamed Eid
Course instructor:	Dr. Mohamed Hussein Mohamed Mohamed Eid
Head of department:	Associate Prof. Ahmed Mohamed Abdullah Hayawan

Signature:

D	M	Y
1	2	2012

Date: