



كلية الهندسة بشبرا

Model No.11A
Course Specifications : Math 2-B

Alfarabi for Quality Assurance and Accreditation System - at 8/6/2013 8:7 PM

University : Benha university

Faculty : Shoubra faculty of engineering

Department : Natural sciences

1- Course Data

Course Code :
EMP182

Course Title : Math 2-B

Study Year : first year

Specialization :

Teaching Hours:

Lecture : 4

Tutorial : 2

Practical : 0

Date of specifications approval: 20/6/2010

2- Course Aim

For students undertaking this course, the aims are to:

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

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a-1 - describe concepts and theories of mathematics and sciences, appropriate to Series solution of ordinary differential equations. (a-1)
- a-2 -mention methodologies of solving engineering problems. (a-5)

b- Intellectual Skills

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

- b-1 - choose appropriate mathematical and computer-based methods for modeling and analyzing problems. (b-1)
- b-2 - create appropriate solutions for Laplace and Inverse Laplace transformations (b-2)
- b-3 -evaluate engineering problems, often on the basis of limited and possible contradicting information. (b- 7)

c- Professional Skills

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

- c-1 - use knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems. (c-1)
- c-2 - perform numerical modeling methods to engineering problems. (c- 7)

4- Course Contents

No.	Topics
1	Series solution of ordinary differential equations
2	Gamma and Beta functions
3	Bessel's functions
4	Legendre's polynomials
5	Laplace and Inverse Laplace transformations
6	Solution of differential equations
7	First order partial differential equations
8	Second order partial differential equations
9	Heat equations
10	Wave equations
11	Systems of linear ordinary differential equations

5- Teaching and Learning Methods

- 5.1- Lectures
- 5.2- Tutorials

6- Teaching and Learning Methods of Disables

- 6.1- Tutorials

7- Student Assessment

a- Student Assessment Methods

1	Assignment to assess $a_1, a_2, b_1, b_2, b_3, c_1, c_2$
2	Mid-term exam to assess a_1, a_2, b_1, b_2, b_3
3	Final exam to assess $a_1, a_2, b_1, b_2, b_3, c_1$

b- Assessment Schedule

No.	Assessment	Week
1	Assignment	3,5,7,9 and 11
2	Mid-term exam	8
3	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Midterm Examination	20 %
Final Term Examination	66 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	0 %
Other types of assessment	14 %
Total	100 %

8- List of References

a- Course Notes

- 1- Lecture material and training sheets

b- Books

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

c- Recommended Books

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

d- Web Sites

1- www.MathematicsResearch.com

2- www.Google.com

Course Coordinator : Dr: Zaki Ahmed Zaki

Head of Department : Prof: sayed ward

Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic	Intellectual	Professional
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			Knowledge	Skills	Skills
1	Series solution of ordinary differential equations	1	a1		c2
2	Series solution of ordinary differential equations	2	a1		c2
3	Gamma and Beta functions	3	a2	b1	
4	Gamma and Beta functions, Bessel's functions and Legendre's polynomials	4	a2	b1	
5	Bessel's functions and Legendre's polynomials	5	a2	b1	
6	Laplace and Inverse Laplace transformations	6	a1	b3	c1
7	Laplace and Inverse Laplace transformations	7	a1	b3	c1
8	Solution of differential equations	9		b2	
9	First order and second order partial differential equations	10	a1	b1	
10	First order and second order partial differential equations	11	a1	b1	
11	Heat and wave equations	12	a2		c2
12	Heat and wave equations	13	a2		c2
13	Systems of linear ordinary differential equations	14	a1		

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