



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

Model No.12
Course Specifications (2014-2015)
Engineering Mathematics (2)

University: Benha University

Faculty: Faculty of Engineering at Shoubra

Department offering the program: Mechanical Engineering Department

Department offering the course: Engineering Mathematics and Physics Department

1- Course Data

Course Code: EMP291

Course Title: Engineering Mathematics (2)

Specialization: Mechanical Production Engineering

Course Type: Compulsory

Study Year: Second Year

Teaching Hours: Lecture: 3

Tutorial: 2

Practical: 0

Total: 5

2- Course Aims

For students undertaking this course, the aims are to be:

- 1- Recognize the basic concepts of Complex analysis.
- 2- Recognize the basic concepts of Fourier analysis.
- 3- Solve the integral equations using Fourier transform.
- 4- Apply numerical methods on solving differential equations

3- Intended Learning Outcomes of Course (ILO's)

- a. Knowledge and Understanding Skills:** On completing this course, students will be able to demonstrate the knowledge and understanding of:
 - a.1) Concepts and theories of mathematics, appropriate to the mechanical engineering. (A.1)
 - a.2) Methodologies of solving differential equations. (A.5)
- b. Intellectual Skills:** At the end of this course, the students will be able to:
 - b.1) Select appropriate mathematical methods for modeling and analyzing problems. (B.1)
 - b.2) Select appropriate solutions for mathematical problems based on analytical thinking. (B.2)
 - b.3) Solve engineering problems, often based on complex and Fourier analysis. (B.7)
- c. Practical and Professional Skills:** On completing this course, the students are expected to be able to:
 - c.1) Apply knowledge of mathematics to solve problems in complex analysis, Laplace and inverse Laplace (C.1).
 - c.2) Apply numerical modeling methods to solve problems of differential equation and curve fitting (C.7).
- d. General and Transferable Skills:** At the end of this course, the students will be able to:
 - d.1 - Collaborate effectively within multidisciplinary team (D.1).
 - d.2 - Lead and motivate individuals (D.5)

4- Course Contents

Week no.	Topics
1	Complex analysis
2	Complex analysis



3	Complex analysis
4	Complex analysis
5	Complex analysis
6	Fourier Analysis, Fourier integral
7	Fourier Analysis, Fourier integral
9	Fourier Analysis, Fourier integral
10	Fourier Analysis, Fourier integral
11	Fourier Analysis, Fourier integral
12	Partial differential equations: One dimensional wave equation
13	Partial differential equations: Separation of variables method, D'Alembert method, Heat equation
14	Partial differential equations: Laplace equation, Poisson equation

5- Teaching and Learning Methods

- 5.1 Lectures
- 5.2 Assignments/homework
- 5.3 Case study
- 5.4 Tutorial problem session

6- Teaching and Learning Methods of Disables

- Nothing.

7- Student Assessment

a- Student Assessment Methods

1. Four Assignments to assess knowledge and intellectual skills.
2. One Quiz to assess knowledge, intellectual and professional skills.
3. Midterm exam to assess knowledge, intellectual, professional and general skills.
4. Final exam to assess knowledge, intellectual, professional and general skills.

b- Assessment Schedule

NO.	Assessment	Week
1	Assignments	3, 5, 9, 11,
2	Quiz	10
3	Midterm exam	8
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight (%)
Mid Term Examination	8 %
Final Term Examination	64 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	12 %
Other types of assessment	16%
Total	100



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8- List of References

a- Course Notes prepared by instructor

b- Recommended Books

- 1- Engineering Mathematics, Fifth Edition, K. A. Stroud, Industrial Press. Inc., New York 2001.
- 2- Advanced Engineering Mathematics, E. Kreyszig, John Wiley and Sons, New York 1999.
- 3- Engineering Mathematics, Fifth Edition, K. A. Stroud, Industrial Press. Inc., New York 2001
- 4- Advanced Engineering Mathematics, E. Kreyszig, John Wiley and Sons, New York 1999

Course Coordinator: Dr. Khaled Mamdouh Ibrahim Elnajjar

Head of Department: Prof. Dr. Osama Ezzat Abdelatif



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FACULTY OF ENGINEERING AT SHOUBRA

Model No.11A

Course Specifications: Engineering Mathematics (2)

University: Benha University

Faculty: Faculty of Engineering at Shoubra

Department offering the program: Mechanical Engineering Department

Department offering the course: Engineering Mathematics and Physics Department

Matrix of Knowledge and Skills of the Course

no.	Topics	Week no.	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General and Transferable Skills
1	Complex analysis	1	a1	b2		d1
2	Complex analysis	2	a1	b2		d1
3	Complex analysis	3	a1	b2		d2
4	Complex analysis	4	a1	b2		d1
5	Complex analysis	5	a1	b2		d2
6	Fourier Analysis, Fourier integral	6	a2	b1	c1	
7	Fourier Analysis, Fourier integral	7	a2	b1	c1	
8	Midterm Exam	8				
9	Fourier Analysis, Fourier integral	9	a2	b1	c1	
10	Fourier Analysis, Fourier integral	10	a2	b1	c1	
11	Fourier Analysis, Fourier integral	11	a2	b1	c1	
12	Partial differential equations: One dimensional wave equation	12	a1	b3	c2	
13	Partial differential equations: Separation of variables method, D'Alembert method, Heat equation	13	a1	b3	c2	
14	Partial differential equations: Laplace equation, Poisson equation	14	a1	b3	c2	
15	Final Exam	15				

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Matrix of Course Aims and ILO's

Course Title: Engineering Mathematics (2)

Course Code: EMP 291

Teaching Hours: Lecture: 3 Tutorial: 2 Total: 5

Major or minor element of program: Major

Program on which the course is given: B.Sc. Mechanical production Engineering

Department offering the program: Mechanical Engineering Department

Department offering the course: Engineering Mathematics and Physics Department

Academic year / level: 2014-2015 Second Year / First Semester

Date of specifications approval: 2014

Course aims	a	b	c	d
• Recognize the basic concepts of Complex analysis.	a1	b1		d1
• Recognize the basic concepts of Fourier analysis.	a1	b2	c1 c2	
• Solve the integral equations using Fourier transform.	a2		c1	d2
• Apply numerical methods on solving differential equations	a1 a2	b1 b3	c1	

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