Model No.12
Course Specifications (2014-2015)
Engineering Mathematics 1

University: Benha University
Faculty: Faculty of Engineering at Shoubra
Department offering the program: Mechanical Engineering Department
Department offering the course: Mathematics and Physics Engineering Department

1- Course Data

Course Code: EMP191 **Course Title:** Engineering Mathematics 1
Specialization: Mechanical Production Engineering **Course Type:** Compulsory **Study Year:** First year
Teaching Hours: Lecture: 4 Tutorial:2 Practical: 0 Total: 6

2- Course Aim

For students undertaking this course, the aims are to:
1. Understand the basic concepts of infinite series.
2. Recognize the basic concepts of function of several variables.
3. Identify the basic concepts of vector analysis.
4. Know the basic concepts of ordinary differential equations.

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

a- Knowledge and Understanding

On completing this course, students will be able to demonstrate the knowledge and understanding of:

a.1) Recognizing concepts of infinite series and vector analysis. (A1)

a.2) solving mathematical problems for different differential equations. (A5)

b- Intellectual Skills

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

b.1) Choose suitable mathematical methods for analyzing mathematical problems. (B.1)

b.2) Choose suitable solutions for mathematical problems based on analytical thinking. (B.2)

b.3) Solve engineering problems, and learn vector analysis. (B7)

c- Professional Skills

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

c.1) Apply knowledge of mathematics equations to solve engineering problems (C1).

c.2) Apply numerical modelling methods to engineering problems. (C2)

d- General 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

No.	Topics
1	Infinite series and expansion of functions
2	Functions of several variables: Partial differentiation
3	maximum and minimum values
4	Lagrange's multipliers and conditional extrema, envelopes
5	Vectors analysis
6	Ordinary Differential Equations
7	Multiple integrals
8	Series solution of Ordinary Differential Equations

5- Teaching and Learning Methods

5.1- Lectures
5.2- Class activity / Tutorial
5.3- Assignments / homework

6- Teaching and Learning Methods of Disables

No.

7- Student Assessment

a- Student Assessment Methods

1 Five assignments to assess knowledge and intellectual skills.
2 One quiz to assess knowledge, intellectual and professional skills.
3 Mid-term 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	3,5,7,9,11
2	Quiz	12
3	Mid-term exam	8
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid-Term Examination	20 %
Final-Term Examination	70 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	5 %
Other types of assessment	5 %
Total	100%

8- List of References

a- Course Notes prepared by instructor

b- Books

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

Course Coordinator: Dr. / Mohammed Zaki
Head of Department: Prof. Dr./ Osama Ezzat Abdullatif

Model No.11A
Course Specifications: Engineering Mathematics 1

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	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Infinite series and expansion of functions	1,2	a1		c1	
2	Functions of several variables: Partial differentiation	3	a5	b7	c7	d5
3	maximum and minimum values	4	a5	b7	c7	d5
4	Lagrange's multipliers and conditional extrema, envelopes	5	a5	b7	c7	d5
5	Vectors analysis	6		b1	c7	
6	Ordinary Differential Equations.	7,9,10,11	a1	b2		
7	Multiple integrals	13,14	a1			d1

Course Coordinator: Dr. / Mohammed Zaki

Head of Department: Prof. Dr. Osama Ezzat Abdelatif

Matrix of Course Aims and ILO's

Course Title: Engineering Mathematics 1

Course Code: EMP191

Teaching Hours: Lecture: 4   Tutorial: 2   Total: 6

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: Math. and Physics Eng. Dept.

Academic year / level: 2014-2015 First Year / first semester

Date of specifications approval: 2014

Course aims	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
Understand the basic concepts of infinite series.	a1	b1, b2		
Recognize the basic concepts of function of several variables.	a1			d1
Recognize the basic concepts of vector analysis.	a5		c7	d1
Know the basic concepts of ordinary differential equations.	a5	b7	c1	d5

Course Coordinator: Dr. / Mohammed Zaki

Head of Department: Prof. Dr. Osama Ezzat Abdelatif