

Model No.12

Course Specifications : Math 3B

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Mathematics and Physics Engineering Department

1- Course Data

Course Code : EMP282 Course Title : Math 3B Study Year : Second Year

Specialization :

Teaching Hours:

Lecture : 3

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- Give the essential information about the numerical solution of the system of equations and matrix inversion.

2.2- Give ability to solve ordinary and partial differential equations numerically.

2.3- Illustrate the essential information about interpolation and curve fitting.

2.4- Illustrate the basic information related to formal graph theory.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

a.1) Illustrate concepts and theories of mathematics and sciences, appropriate to the Numerical Solution of linear equation, ordinary differential and practical differential equations (a.1).

a.2) Describe methodologies of numerical solution of matrix inversion (a.5)

b- Intellectual Skills

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

b.1) Select appropriate mathematical and computer-based methods for interpolation and curve fitting (b.1)

b.2) Select appropriate solutions for ordinary differential and practical differential equations based on analytical thinking. (b.2)

b.3) Solve engineering problems of matrix inversion, often on the basis of limited and possibly contradicting information (b.7)

c- Professional Skills

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

c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice for linear equation based on numerical solution. (c.1)

c.2) Apply numerical solution to matrix inversion and numerical modeling to interpolating curve fitting and formal graph theory (c.7)

d- General Skills

None

4- Course Contents

Week No.	Topic	No. of hrs	ILOs	Teaching/learning methods and strategies	Assessment method
1	Numerical Solution of linear equation	5	a1 c1	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
2	Numerical Solution of linear equation	5	a1 c1	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
3	Numerical Solution of matrix inversion	5	a2 b3 c2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
4	Numerical Solution of matrix inversion	5	a2 b3 c2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
5	Numerical Solution of ordinary differential equations	5	a1 b2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
6	Numerical Solution of ordinary differential equations	5	a1 b2	Presentation board, computer and data show	Home Assignments, Quizzes, Oral Exam
7	Numerical Solution of partial differential equations	5	a1 b2	Classroom, computer And data show	Home Assignments, Quizzes, Oral Exam
8	Mid-term exam				
9	Numerical Solution of partial differential equations	5	a1 b2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
10	Interpolation and curve fitting	5	b1 c2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
11	Interpolation and curve fitting	5	b1 c2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam

12	Formal Graph theory	5	c2	Classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
13	Formal Graph theory	5	c2	classroom board, computer and data show	Home Assignments, Quizzes, Oral Exam
14	Formal Graph theory	5	c2	Presentation board , computer and data show	Home Assignments, Quizzes, Oral Exam
15	Final exam				
16					

5- Teaching and Learning Methods

- 5.1- Modified Lectures
- 5.2- Lectures
- 5.3- Tutorials
- 5.4- Class activity

6- Teaching and Learning Methods of Disables

None

7- Student Assessment

a- Student Assessment Methods

1	Assignment to assess a1,a5 - b1,b2,b7 - c1,c7 - d1,d5
2	Mid-term exam to assess a1,a5 - b1,b2,b7
3	Quiz to assess a1,a5 - b1,b2,b7
4	Final exam to assess a1,a5 - b1,b2,b7 - c1,c7

b- Assessment Schedule

No.	Assessment	Week
1	Assignment	1,3,5,7,9 and 11
2	Mid-term exam	8
3	Quiz	12
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Written examination	64 %
Oral examination	0%
Practical/ Laboratory work	0%
Other assignments/ Class work	36 %
Total	100%

8- List of References

a- Course Notes

- 1- Lecture material and training sheets

b- Books

- 1- Advanced calculus, w.fulks (J.W.S).

c- Recommended Books

- 1- Introduction to Numerical Analysis ,F.B, Hildebrand (MC Grawhill).
- 2- Applied Numerical Analysis, Curris F.Gerald patricko publishing.
- 3- Numerical methods for E and S.John Wiley&A.W.Sons.

d- Web Sites

- 1- www.MathematicsResearch.com
- 2- www.numericalmethodsResearch.com
- 3- www.operationResearch.com
- 4- www.Google.com

Matrix of course content and ILO's

Course Title: Math 3B

Code: EMP282

Lecture: 3

Tutorial: 2

Practical: 0

Total: 5

Program on which the course is given: B.Sc. Electrical Engineering (Electronics and Communication)

Major or minor element of program: Department offering the program: Major

Department offering the course: Electrical Engineering Department

Academic year / level: Second Year/ Second Semester.

Date of specifications approval: 20/6/2010

Course content	ILO a's		ILO b's			ILO c's	
	1	2	1	2	3	1	2
Numerical Solution of linear equation					✓	✓	✓
Numerical Solution of matrix inversion	✓	✓	✓	✓	✓	✓	
Numerical Solution of ordinary differential equations					✓	✓	✓
Numerical Solution of partial differential equations	✓	✓	✓	✓	✓	✓	
Interpolation and curve fitting					✓	✓	✓
Formal Graph theory	✓	✓	✓	✓	✓	✓	

Matrix of course aims and ILO's

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Course Aims	ILO a's		ILO b's			ILO c's	
	1	2	1	2	3	1	2
Recognize the essential information about the numerical solution of the system of equations and matrix inversion					✓	✓	✓
Solve ordinary and partial differential equations numerically.	✓	✓	✓	✓	✓	✓	
Recognize the essential information about interpolation and curve fitting.					✓	✓	✓
Recognize the basic information related to formal graph theory.	✓	✓	✓	✓	✓	✓	

Course coordinator: Dr. Zaki Ahmed Zaki

Course instructor: Dr. Zaki Ahmed Zaki

Head of department: Prof. Dr. Sayed A. Ward