Relevant Program*: B.Sc. (Science & Education), Mathematics ,Basic Education*

Major or minor element of programmes : Major

Department offering the program: Educational Depts. + Math Department
Faculty of Science
Department offering the course: Mathematics

Academic year / Level   Second Year   (First Term)

Date of specification approval : 20 / 10 / 2008

A- Basic Information

Title: Linear Algebra   Code: ١٧٢١٣ Mat

Credit Hours:--   Lecture: 3

Tutorial: 2   Practical: Total: 70

B- Professional Information

1- Overall Aims of Course

On completion of this course student will be able to:
1-Be familiar with the fundamental concepts of linear algebra.
2-Solve system of linear equations by advanced methods of elimination and also   apply some approximate methods.
3-Evaluate the eigen value and eigen vector of matrix.
4-Know and understand the concept of vector space.

2- Intended Learning Outcomes of Course (ILOs)

A- Knowledge and understanding:

١- أ. Student will be know and understand the fundamental concepts and   properties of matrices, vector spaces and will be able to convey the meaning of these concepts to others.

١-٢.أ Understand and distinguish between different cases of linear systems solutions.
B- Intellectual Skills:

١-٢.ب Student will be able to illustrate applications of the methods.
٢- .ب Show mathematical thinking for students to be self independent in
problem solving.

C- professional and Practical Skills:

١-١.ت Students will be able to convey the meaning of these concepts to others.

١-٢.ت Training problem solving and studying in small team.

D- General and Transferable Skills:

١-٢.ث Using new technological tools.

١-٣.ث Group working.

١-٥.ث Able to convey the meaning of the above concepts to others.

3- Contents :

Topic	No. of Hours	Lecture	Tutorial / Practical
1-System of linear equations and matrices (Gaussian elimination, matrices and matrices operations, inverse, rules of matrix arithmetic elementary matrices as method of finding inverse matrix).	12	4	8
2-Determinates, properties of the determinates.	6	2	4
3-Vector in 2-space and 3-space, definition, norm of vector, dot product, cross product, line and plane in 3-space.	6	2	4
4-General vector spaces, subspaces, linear independent basis and dimension Cauchy- Schwarz inequality Def. of angle between two-vectors in R^n, orthonormal basis Gram-Schmidt orthogonalization process.	6	2	4
5-Eigen values and Eigen vectors.	6	2	4
6-Linear transformation, kernel and rang. Matrices of linear transformation, similarity.	**6**	**2**	4

4- Teaching and Learning Methods:

4-1: Lectures.

4-2: Discussion sessions.

4-3: Research assignment .

5- Student Assessment Methods:

5-1: Written exam (mid-term)to assess the level of knowledge

and understanding.

5-2: Class work (quizzes) to assess the level of Intellectual skills
to discuss and solve some problems .

5-3: Written exam (at the end of term) to assess the ability to pass the

Exam.

Assessment Schedule:

Assessment 1: Written exam (mid-term) Week 7

Assessment 2: Class work (quizzes) Week 4 - 8 - 12

Assessment 3: Written exam (at the end of term) Week at the end term.

Weighting of Assessments:

Mid-Term Examination	**30**	%
Final-Term Examination	**70**	%
Oral Examination		%
Practical Examination		%
Semester Work		%
Other Types of Assessment		%
Total :		100%

Any formative only assessments

6- List of References:

6-1: Course Notes:

Course notes prepared by staff of math. Dept.

6-2: Essential Books (Text Books):

Mahmoud sofy(2008): Alinear algebra

6-3: Recommended Books:

David C. lay. Linear algebra and its application (3rd Edition), Addison Wesley, (2002)

6-4: Periodicals, Web Sites, …….. etc:

http://mathworld.wolfram.com/topics/algebra.html

7- Facilities Required for Teaching and Learning

Library contains new edition books with enough copies.

Data show

Computer Lab

Course Coordinator: Dr.Aisha

Head of Department Prof. Kamal Ahmed El Dab

Date: / /