ATTACHMENT 5.

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

T6. Course Specifications (CS)

Course Specifications

Institution **King Khaled University**	Date **2016**
College/Department **College Sciences/ Department of Mathematics**	

A. Course Identification and General Information

1. Course title and code: **MATRIX ALGEBRA (MATH 012)**		
2. Credit hours **3**		
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Faculty of computer Science**		
4. Name of faculty member responsible for the course		
5. Level/year at which this course is offered **Second level / first Academic Year**		
6. Pre-requisites for this course (if any) **001 Math**		
7. Co-requisites for this course (if any)		
8. Location if not on main campus **Faculty of computer science**		
9. Mode of Instruction (mark all that apply)		
a. traditional classroom	yes	What percentage? 100
b. blended (traditional and online)		What percentage?
c. e-learning		What percentage?
d. correspondence		What percentage?
f. other Comments:		What percentage?

B Objectives

1. What is the main purpose for this course? **The course give some methods to solve linear systems using matrix operations, determinants, inverses, Cramer's rule, Gauss-jordan elimination.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **I- Revision and updating of the course contents.** **II- To give more important time to the Mathematics in the engineering formation.**

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to the system of linear equations. Augmented matrices, Elementary row operations.	**2**	**9**
Gaussian Elimination Reduced row-Echelon form. Gauss-Jordan elimination. Back-Substitution Homogeneous linear system of equations.	**3**	**9**
Matrices and Matrix operations. Matrix form of a liner system. Transpose and Trace of a matrix	**1**	**3**
Properties of matrix operations. Properties of inverses and transpose	**1**	**3**
A method for finding the inverse of a matrix . Further results on systems of equations and inevitability.	**1**	**3**
Diagonal, triangular and symmetric matrices.	**1**	**3**

The determinant function - Evaluating determinants by row reduction	1	3
Properties of the determinant function	1	3
Cofactor expansion-Cramer's rule-Inverse of a matrix using its adjoint.	1	3
Vector space, Linear dependent and linear independent , Eigen values and Eigen vectors	2	6
Basis and Dimensional of vector space	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	45					
Credit						

3. Additional private study/learning hours expected for students per week.
None

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		

	The course give some methods to solve linear systems using matrix operations, determinants, inverses, Cramer's rule, Gauss-jordan elimination.		
1.1			
1.2			
2.0	**Cognitive Skills** **- To use the techniques and theorems in the area of speciality and in the all field where it is possible** **- To develop the spirit of analysis and logic.** **Teaching strategies to be used to develop these cognitive skills** **- Discussion groups.** **- Collect information paper about selected cases or topics through the internet sources and libraries.** **Methods of assessment of students cognitive skills** **- Interview with students.** **- - Research projects.** **- iii- Online / in class group discussions.** **- iv- Assessment of written reports.**		
2.1			
2.2			
3.0	**Interpersonal Skills & Responsibility** **(i) Description of the interpersonal skills and capacity to carry responsibility to be developed** **i- Work independently and as part of a team.** **ii- Manage resources, time and other members of the group.** **iii- Communicate results of work to others.** **(ii) Teaching strategies to be used to develop these skills and abilities** **i- Writing group reports.** **ii- Solving problems in groups.** **(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility** **i- Student's behaviour is considered in the continuous assessment marks.** **ii- Grading research projects.** **iii- Assessing oral discussion of different cases.** **iv- Final evaluation of the works.**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical** **(i) Description of the skills to be developed in this domain.** **i- Use computational tools** **ii- Report writing** **7**		

	iii- How to search and use the internet. **iv- How to use power point to present their projects.** **v- How to improve their language and writing skills** **(ii) Teaching strategies to be used to develop these skills** **i- Writing reports.** **ii- Incorporating the use and utilization of computer in the course requirements.** **iii- Hands on training on different software like Microsoft office and internet.** **(iii) Methods of assessment of students numerical and communication skills i - Direct evaluation of take home projects.** **ii- Presentations and live discussion.**		
4.1			
4.2			
5.0	**Psychomotor** **(i) Description of the psychomotor skills to be developed and the level of performance required** **- Student should manipulate all the mathematical knowledge in real-life problems.** **-Capacity to present and discuss mathematical ideas and to acquire mathematical proof skills.** **- Comprehension of the concepts of mathematics as an integral system in the human knowledge and its applications.** **(ii) Teaching strategies to be used to develop these skills** **- Attending seminars and conferences held in the department.** **(iii) Methods of assessment of students psychomotor skills** **- Continuous evaluation to perform the student's skills.**		
5.1			
5.2			

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)**								
	1.1	**1.2**		**2.1**		**3.2**		**4.1**	
1.1									
2.1									

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	**First mid term exam**	**6**	**25%**
2	**Second Midterm exam**	**12**	**25%**
3	**Final Exam**	**16**	**50%**
4			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)** **- Office hours (10 hours per week).** **- Contacts through university's E-learning system.** **- E-mail messages.**

E Learning Resources

1. List Required Textbooks **Howard Anton, Elementary Linear Algebra, 8th Edition, John Wiley & Sons, Inc 2005.**
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Lecture room equipped with 30 seats and computer and projecting unit with audio system**
2. Computing resources (AV, data show, Smart Board, software, etc.) Computers with monitors connected to the internet and KKU- e-learning center
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
- Feedback questionnaire distributed to the students after midterm. **- Students- faculty meeting** **- Department meetings.**
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department **- Peer consultation on teaching.** **- Departmental council discussions.** **- Discussions within the group of faculty teaching the course.** **- Discussing contributors' reports.** **- Discussing the reports of the guest evaluator(s).** **- Discussing the evaluation of the quality assurance/academic affairs committee.**
3 Processes for Improvement of Teaching **- Conducting workshops given by experts on the teaching and learning methodologies.** **- Using different teaching modalities.** **- Periodical departmental revisions of the methods of teaching.** **- Monitoring of teaching activities by senior faculty members.**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Providing samples of all kind of assessment in the departmental course portfolio of each course. **- Assigning group of faculty members teaching the same course to grade same questions for various students.** **- Faculty from other institutions are invited to review the accuracy of the grading policy.**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **- Assigning periodical student' questionnaires.** **- Follow up of the quality assurance/academic affairs committee.** **- The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils.** **- The head of the department and faculty take the responsibility of implementing the proposed changes.**

Name of Instructor: Ahmed Elwan

Signature:_____Date Report Completed: 21/11/2016

Name of Course Instructor
Program Coordinator: Ahmed Elwan

Signature: _____ Date Received:_____