T-104
2022

Course Specification

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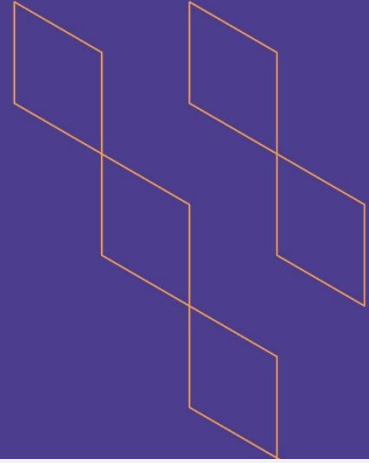
Course Title:	**Linear Algebra (1)**
Course Code:	**261Math-3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Art and Sciences**
Institution:	**Najran University**
Version:	1
Last Revision Date:	**07-05-2023**

Table of Contents:

A. General information about the course:

Course Identification				
1. Credit hours:	**3**			
2. Course type				
a.	University ☐	College ☐	Department ☒	Track☐	Others☐
b.	Required ☒	Elective☐		
3. Level/year at which this course is offered:		**3/2**		

4. Course general Description
The course covers the following aspects Matrices algebra (Operations on Matrices, Some Types of matrices, Row reduction of matrices, Inverse of a matrix). Determinants (Determinant Calculator and their properties, Conjugate of Matrices, Finding the Inverse of a Matrix). System of linear equations and their solutions (Homogeneous and Nonhomogeneous Systems of Linear Equations, Representing Systems of Linear Equations using Matrices, Methods for Solving Systems of Linear Equations: Elimination method, Gauss-Jordan Method, By using Matrix inverse method, Reduction method, Cramer's Method)

5. Pre-requirements for this course (if any):
Foundations of Mathematics (111Math-3)

6. Co- requirements for this course (if any): None

7. Course Main Objective(s)

 The main objectives of the course are to: introduce basic concepts and skills in matrices algebra and present methods of solving systems of linear equations.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	**3**	**100%**
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	**45**
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define Matrix and Matrix operations and state their basic properties	K1	Lecture discussions	-Quiz -Written Exam -Homework
1.2	Define Matrix and Matrix operations and state their basic properties			
1.3	Recognize methods for solving systems of linear equations			
2.0	Skills			
2.1	Calculate the determinants, invert and conjugate matrices	S1	Lecture discussions	-Quiz -Written Exam -Homework
2.2	Solve systems of linear equations			
2.3	Apply the row reduction algorithm to reduce a linear system to echelon form, or reduced echelon form			
3.0	Values, autonmy, and responsibility			
3.1	Work as part of a team and independently	V1	Homework	-Oral Exam -Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	**Matrices**	
1.1	Operations and Types of matrices	6
1.2	Row reduction of Matrices	6
1.3	Inverse of a matrix by using Row reduction	6
2	**Determinants**	
2.1	Matrix determinant calculator	6
2.2	and conjugate of matrices Properties of determinants	6
2.3	Inverse of a matrix by using determinant	6
3	**Homogeneous and nonhomogeneous systems of linear equations**	
3.1	Representing Systems of Linear Equations using Matrices	3
3.2	Methods for solving systems of linear equations	6
	Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam 1	6-8	20
2.	Assignments & Quizzes	During classes	10
3.	Midterm Exam 2	13-15	20
4.	Final Exam	16-17	50

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	الجبر الخطي وتطبيقاته د. معروف سمحان- د. علي السحيباني و د. فوزي الذكير (الطبعة الرابعة 2014)
Supportive References	Nicholson, W. Keith Linear algebra with applications 7th Edition
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with suitable seat**
Technology equipment (projector, smart board, software)	**Data show**
Other equipment (depending on the nature of the specialty)	**Smart Board**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Council of Mathematics Department
REFERENCE NO.	14441017-0208-00014
DATE	17-10-1444H