Course Specification
(Postgraduate)

Course Title:	**Linear Algebra**
Course Code:	**Math632**
Program:	*Enter Program Name.*
Department:	**Mathematics**
College:	**College of Science and Humanities in Alkharj**
Institution:	**Prince Sattam bin Abdulaziz University**
Version:	**2024**
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification:

1. Credit hours: (3)				
2. Course type				
A.	☐University	☐College	☐Department	☐Track
B.	☒ Required		☐Elective	
3. Level/year at which this course is offered: (.....)				
4. Course general Description:				
Linear functional and dual spaces, Canonical form of linear transformations, Jordan and rational forms, Multilinear forms, Hermitian, unitary and normal transformations, Tensor product of vector spaces.				
5. Pre-requirements for this course (if any)**:**				
NIL				
6. Pre-requirements for this course (if any)**:**				
NIL				
7. Course Main Objective(s):				
To provide an in-depth knowledge in Linear functionals and dual spaces, linear transformation and its canonical forms and tensor products.				

2. Teaching Mode: (mark all that apply)

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

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	32
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	16
5.	**Others (specify)……**	16
	Total	64

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	**Gain knowledge through examples and counter examples of Linear functionals, dual spaces, linear transformation and canonical forms of linear transformation and tensor products.**	**K1**	1. Class Room Lectures 2.Interactive sessions 3.Exclusive Office Hours for clearing doubts in small groups	1. Two Internal Exams 2.At least two Quiz 3. End Semester Exam
1.2	**Recall and reproduce the properties and theorems in Linear functionals, dual spaces, linear transformation and canonical forms of linear transformation and their applications**	**K3**		
2.0	**Skills**			
2.1	**Contrast the concept of Linear functionals and linear transformations.**	**S1**	**Application oriented exercise during lectures and tutorials**	**Exams** **Application oriented exercise as HW**
2.2	**Develop problem solving skills on Linear functionals, dual spaces, linear transformation and**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	canonical forms of linear transformation			
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
...				

C. Course Content:

No	List of Topics	Contact Hours
1.	Preliminaries	3
2.	Linear Functional	3
3.	Dual Space	3
4.	Linear functional and dual space continued.	3
5.	Linear Transformation	3
6.	Canonical forms of Linear Transformation	6
7.	Canonical forms continued	3
8.	Jordan Canonical Form	3
9.	Rational Forms	3
10.	Hermitian and Unitary Transformations	6
11.	**Normal transformations**	3
12.	**More theorems on canonical forms**	3
13.	**Tensor products**	3
14.	**Tensor products continued**	3
Total		**48**

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid Term Exam I	6	15%
2.	Quiz (Atleast 2 quiz)	4 & 10	10%
3.	Mid Term Exam II	13	15%
4.	Continuous Assessment – Homework, Assignment, Attendance etc.	--	10%
5,	End Semester Exam	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	
Supportive References	**Numerical linear algebra : Theory and Applications, by Larisa Beilina, Evgenii Karchevskii, and Mikhail Karchevskii, Springer, 2017.** **Linear Algebra by Vashishta and Sharma** **Advanced Abstract Algebra by H.K Pathak** **Linear Algebra, Schaums outline series**
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms with Smartboards with seating facilities for at least 30 students
Technology equipment (Projector, smart board, software)	Smartboard, Internet Connection for Blackboard
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect

Assessment Areas/Issues	Assessor	Assessment Methods
	Peer Review/Class Room Observation	
Effectiveness of students assessment	Independent member teaching staff	Check marking by an independent member teaching staff of samples of student work.
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Faculty Member Quality Unit of College and department	Direct Learning outcomes assessment.
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	