

M-107 Vectors and Matrices (3+0) credit-hours.

Semester 1434 – 1435 H

Weekly Course Details

Linear Algebra

WEEK 1

Chapter 1: System of Linear Equations

- 1.1 System of linear equation ✓
- 1.2 Methods for solving system of linear equations ✓
- 1.3 Gauss Elimination Method

WEEK 2

- 1.4 Gauss Jordan Method
- 1.5 Row Echlon form
- 1.6 Reduced Row Echlon form
- 1.7 Homogeneous system

WEEK 3

Chapter 2: Matrices

- 2.1 Matrix and Algebra of Matrices
- 2.2 Scalar Multiplication
- 2.3 Matrix Multiplication
- 2.4 Inverse of 2x2 matrix
- 2.5 Power of Matrix
- 2.6 Elementary Matrix
- 2.7 Methods of finding inverse of matrix
- 2.8 Solving Linear system by Inverse Matrix

WEEK 4

Chapter 3: Determinant

- 3.1 Determinant
- 3.2 By Direct Multiplication
- 3.3 By cofactor
- 3.4 By row operation

WEEK 5

- 3.5 Properties of Determinantal function
- 3.6 Minor and cofactors, Inverse by cofactors
- 3.7 Crammer' Rule

WEEK 15

Revision WEEK

Calculus

WEEK 6

Chapter 10: Vectors and the Geometry of Space

- 10.1 Vectors in the Plane
- 10.2 Vectors in Space
- 10.3 The Dot Product

WEEK 7,8

- 10.4 The Cross Product
- 10.5 Lines and Planes in Space
- 10.6 Surfaces in Space

WEEK 9

Chapter 11: Vector-Valued Functions

- 11.1 Vector-Valued Functions
- 11.2 Limits, Derivatives
- 11.3 Velocity, Acceleration.

WEEK 10

- 11.4 Curvature, Unit Tangent Vector, Principal Normal Vector
- 11.5 Tangential and Normal Components of Acceleration

WEEK 11

Chapter 12: Functions of Several Variables and Differentiation

- 12.1 Functions of Several Variables
- 12.2 Limits and Continuity

WEEK 12

- 12.3 Partial Derivatives

WEEK 13

- 12.4 Tangent Planes and Linear Approximations, Increments and Differentials
- 12.5 The Chain Rule

- 12.6 The Gradient and Directional Derivatives

WEEK 14

- 12.7 Extrema of Functions of Several Variables
- 12.8 Constrained Optimization and Lagrange Multipliers

Textbook(s)/ Additional Material

1. Linear Algebra by H. Anton (any book on Linear Algebra from Library 512.5)
2. Calculus by Swokowski, Olinick and Pence, 6th Ed, PWS publishing Co. (any book on Calculus from Library 515.15)

Additional Material:

Lecture Notes on

Linear Algebra, Vector and Several Variables Calculus

by Khawaja Zafar Elahi

Midterm Examinations:

Midterm Examination I: Date:

Midterm Examination II: Date:

week

Material covered in first 6 week

Material covered in 7th week to 13th

For announcement regarding course and for previous Exam papers, ...
check web page

<http://faculty.ksu.edu.sa/khawaja/default.aspx>