Gujarat University

National Education Policy-2020

Syllabus for B. Sc. Sem-II (Mathematics-Multi-Disciplinary)

Effective from June-2023

Subject Code For UG Science Courses: - MAT

Semester	Discipline Specific Courses - Core (DSC - C)	Minor (DSC - M)	Multi / Inter disciplinary courses (MDC / IDC)	Ability Enhancement Courses (Language) (AEC)	Enhancement Courses / Internship / Dissertation Skill	Common Value Added Courses (VAC / IKS)	Total Credits
I	DSC - C - MAT - 111T : 4 DSC - C - MAT - 112P : 4	DSC - M - MAT - 113T : 2 DSC - M - MAT - 113P : 2	MDC - MAT - 114T : 2 MDC - MAT - 114P : 2	AEC - 115 : 2	SEC - 116 : 2	IKS - 117 : 2	22
II	DSC - C - MAT - 121T : 4 DSC - C - MAT - 122P : 4	DSC - M - MAT - 123T : 2 DSC - M - MAT - 123P : 2	MDC - MAT - 124T : 2 MDC - MAT - 124P : 2	AEC - 125 : 2	SEC - 126 : 2	VAC - 127 : 2	22
III	DSC - C - MAT - 231T : 4 DSC - C - MAT - 232T : 4 DSC - C - MAT - 233P : 4	-	MDC - MAT - 234T : 2 MDC - MAT - 234P : 2	AEC - 235 : 2	SEC - 236 : 2	IKS - 237 : 2	22
IV	DSC - C - MAT - 241T : 4 DSC - C - MAT - 242T : 4 DSC - C - MAT - 243P : 4	DSC - M - MAT - 244T : 2 DSC - M - MAT - 244P : 2	-	AEC - 245 : 2	SEC - 246 : 2	VAC - 247 : 2	22
V	DSC - C - MAT - 351T : 4 DSC - C - MAT - 352T : 4 DSC - C - MAT - 353P : 4	DSC - M - MAT - 354T : 4 DSC - M - MAT - 355P : 4	-	-	SEC - 356 : 2	-	22
VI	DSC - C - MAT - 361T : 4 DSC - C - MAT - 362T : 4 DSC - C - MAT - 363P : 4	DSC - M - MAT - 364T : 2 DSC - M - MAT - 364P : 2	-	AEC - 365 : 2	Internship - 4	-	22
VII	DSC - C - MAT - 471T : 4 DSC - C - MAT - 472T : 4 DSC - C - MAT - 473P : 4	DSC - M - MAT - 474T : 2 DSC - M - MAT - 474P : 2	-	-	-	OJT / RP - 6	22
VI	DSC - C - MAT - 481T : 4 DSC - C - MAT - 482T : 4 DSC - C - MAT - 483P : 4	DSC - M - MAT - 484T : 2 DSC - M - MAT - 484P : 2	-	-	-	OJT / RP - 6	22

Syllabus for B.Sc. Semester – II (MATHEMATICS)

Course: MDC - MAT - 124T:

Introduction to Matrices and IKS

Credit: 2

UNIT I (IKS)

a) Matrices & Determinants (in context of IKS): Introduction and History of Matrices and Determinants, Properties of determinant, Vedic methods to solve 3x3 and 4x4 determinants (Urdhva Tiryagbhyam), Inverse of Matrices
b) System of simultaneous linear equations by Vedic sutras (in the context of IKS): Paravartya Yojayet, Anurupye Sunyamanyat, Sankalana Vyavakalana-bhyam

UNIT II:

Introduction to matrices, different types of matrices, operations on matrices, Theorems on matrices, Elementary operations on matrices and types of matrices, Symmetric and skew-symmetric matrices, Hermitian and skew-Hermitian matrices. Linear dependence and independence of row and column matrices. Row rank, column rank, and rank of a matrix. Row Reduced Echelon (RRE) form of a matrix and matrix inversion using it.

Reference Books:

1) Elementary Linear Algebra – H. Anton and C. Rorres, John Wiley & Sons, Tenth edition
2) A Textbook of Matrices – Shanti Narayan, P K Mittal, S. Chand (2010)
3) Matrix and Determinant, N. H. Shah, F. A. Thakkar, CRC Press (2020)
4) An Introduction to Linear Algebra – I. K. Rana, Ane Books Pvt. Ltd. (2010)
5) Matrix and Linear Algebra – K. B. Dutta, Prentice Hall (2004)

Syllabus for B.Sc. Semester – II (Mathematics Practical)

Course: MDC - MAT - 124P: Mathematics Practicals

Credit: 2

List of Practicals

1. Examples based on properties and operations on matrices
2. Examples based on the product of matrices
3. Examples based on symmetric, skew-symmetric, Hermitian, and skew-Hermitian matrices
4. Represent a given square matrix as a sum of symmetric and skew-symmetric matrices
5. Represent a given square matrix as a sum of Hermitian and skew-Hermitian matrices
6. Examples of RRE form
7. Examples of rank of matrices
8. Find the inverse of a matrix using the RRE form
9. Examples on determinants
10. Examples on the inverse of Matrices
11. Examples on solving a system of linear equations by RRE method
12. Examples to solve a system of linear equations by Cramer's method

Reference Books:

1) Elementary Linear Algebra – H. Anton and C. Rorres, John Wiley & Sons, Tenth edition
2) A Textbook of Matrices – Shanti Narayan, P K Mittal, S. Chand (2010)
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