



JAI NARAIN VYAS UNIVERSITY, JODHPUR

SYLLABUS

(Three/Four Year Undergraduate Programme)

[B.Sc./B.A.] [Mathematics]

Semester I & II Examination [2026-27]

(As per NEP 2020)

Examination Scheme for the [B.Sc./B.A.] [Mathematics]-2026-27

NHEQF Level	Semester*	Course Type	Course Code	Course Title	L	P	H/W	Total Hours	Credits	Total Credits	CA Marks	EoSE Marks	M.M.
4.5	I	MNR	08/MAT/MNR/101/T	Fundamentals of Functions and Calculus	L		6	90	6	6	30	120	150
4.5	II	MNR	08/MAT/MNR/151/T	Geometry	L		6	90	6	6	30	120	150

B.Sc. /B.A. (Mathematics) Syllabus, Semester-I		
Session 2026-2027		
Part-A Introduction		
Subject	Mathematics	
Semester	I	
Name of the Course	Fundamentals of Functions and Calculus	
Course Code	08/MAT/MNR/101/T	
Course Type:	MNR(Minor)	
Level of the course (As per Annexure-I)	100-199	
Pre-requisite for the course (if any)		
Course Learning Outcomes (CLO)	After completing the course, the student will be able to: CLO1: Understand trigonometric functions, identities, and inverse trigonometric functions. CLO2: Explain relations and functions including their types and properties. CLO3: Apply concepts of limits and continuity to analyze functions. CLO4: Compute derivatives using rules of differentiation and higher order derivatives. CLO5: Evaluate indefinite and definite integrals using standard integration methods.	
Credits	6	
Total Marks	30+120=150	
Part-B Contents of the Course		
Total lecture per week	6	
Units	Topics	No. of Lecture/Contact Hours
I	Trigonometric Functions: Introduction, Trigonometric Ratios, Trigonometric Identities, Inverse Trigonometric Functions.	18
II	Relations: Ordered pairs, Cartesian product, Types of relations: reflexive, symmetric, transitive, equivalence, Equivalence classes. Functions: Definition, Domain, co-domain, range, Types: one-one, onto, bijective.	18
III	Limits and continuity: Concept of limits and continuity, properties of limits and continuity and related problems.	18
IV	Differentiability: Derivative from first principle, Differentiation Rules: Sum, product, quotient, Chain rule. higher order Derivatives: Second order derivative, Successive derivatives.	18
V	Indefinite Integral, Anti-derivative concept, Standard integrals, Substitution method, Integration by parts, Definite Integral and its properties.	18

Activities

- **Classroom Discussions and Concept Clarification:**
- **Short Written Assignments/Concept Notes:.**
- **Group Discussions and Presentations**
- **Case Study/Contemporary Issue Analysis:**
- **Debates and Interactive Sessions:**

Part-C Learning Resources**Recommended Books:**

- **NCERT – Mathematics for Class XII – NCERT Publication**
- **S. L. Loney – Plane Trigonometry – Arihant Publications**
- **Hall & Knight – Higher Algebra – Arihant Publications**
- **R. D. Sharma – Mathematics for Class 12 – Dhanpat Rai Publications**
- **Shanti Narayan – Differential Calculus – S. Chand & Company**
- **Shanti Narayan – Integral Calculus – S. Chand & Company**

Note: Latest edition of text books and reference books may be used.

B.Sc./B.A. (Mathematics) Syllabus, Semester-II		
Session 2026-2027		
Part-A Introduction		
Subject	Mathematics	
Semester	II	
Name of the Course	GEOMETRY	
Course Code	08/MAT/MNR/151/T	
Course Type:	MNR(Minor)	
Level of the course (As per Annexure-I)	100-199	
Pre-requisite for the course (if any)		
Course Learning Outcomes (CLO)	After completing the course, the student will be able to: CLO1: Apply concepts of the Cartesian coordinate system to determine distance, section, midpoint, and area of a triangle. CLO2: Analyze properties of straight lines including slope, angle between lines, and conditions for parallelism and perpendicularity. CLO3: Understand equations and properties of circles including tangents and normals. CLO4: Analyze properties and equations of parabola and ellipse including tangents and normals. CLO5: Explain the standard equation and properties of hyperbola including axes, foci, and tangents.	
Credits	6	
Total Marks	30+120=150	
Part-B Contents of the Course		
Total lecture per week	6	
Units	Topics	No. of Lecture/Contact Hours
I	2-D Coordinate System: Cartesian coordinate system, Distance formula, Section formula, Midpoint formula, Area of triangle (coordinate method). Straight Line: Slope of a line, Angle between two lines, Conditions for parallelism and perpendicularity.	18
II	Circle: Standard Equation: Circle with centre at origin, Circle with arbitrary centre, General equation of circle, Properties of Circle, Tangents and Normals on circle, chord of contact.	18
III	Parabola: Standard Parabolas: Vertex, focus, directrix, axis, Latus rectum, Parametric Form: Parametric coordinates, Equation of tangent (parametric), Normal to parabola, chord of contact.	18
IV	Ellipse: Standard Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, Major and minor axes, Foci and eccentricity, Latus rectum, Tangent and normal, Properties: Focal property, Director circle (intro), Chord of contact.	18
V	Hyperbola: Standard Hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, transverse and conjugate axes, Foci and eccentricity, Latus rectum, Tangent and normal, Chord of contact.	18

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- **Group Discussions and Presentations**
- **Case Study/Contemporary Issue Analysis:**
- **Debates and Interactive Sessions:**

Part-C Learning Resources**Recommended Books:**

- J.L. Bansal & S.L. Bhargava: 2-D Coordinate Geometry (Hindi Ed) Jaipur Publishing House, Jaipur.
- Sharma, C.L. Varshney: Coordinate Geometry, Pragati Prakashan, Meerut.

Note: Latest edition of text books and reference books may be used.