DEPARTMENT OF MATHEMATICS AND STATISTICS

JAI NARAIN VYAS UNIVERSITY:JODHPUR

B.Sc./B.A. Mathematics Three Years Program: Semester wise Course Type, Course Code, Workload, Credits and Maximum Marks

FOR THE ACADEMIC SESSIONS: 2023-24, 2024-25 & 2025-26

Level	Sem.	Course Type	Course Code	Course Title	L	P	H/W	Total Hours	Credits	Total Credits	SessionalMarks	EoSE Marks	M.M.
5	I	DCC	MAT5001T	Calculus	6	-	-	90	6	6	30	70	100
				Other Department -1						6			
				Other Department-2						6			
		AEC		Either Hindi or English	2		2	30		2	30	70	100
				Total credits						**20**			
	II	DCC	MAT5002T	Algebra	6	-	-	90	6	6	30	70	100
				Other Department -1						6			
				Other Department-2						6			
		AEC		Environmental Science	2		2	30		2	30	70	100
				Total credits						**20**			
		Exit With B.Sc./B.A. Certificate and Entry with B.Sc. Certificate for B.Sc. Diploma											
6	III	DCC	MAT6001T	Differential Equation	6	-	-	90	6	6	30	70	100
				Other Department -1						6	30	70	100
				Other Department-2						6	30	70	100
		SEC		Choose any one SEC from the list provided for Semester III						2	30	70	100
				Total credits						**20**			
	IV	DCC	MAT6002T	Analysis	6	-	-	90	6	6	30	70	100
				Other Department -1						6	30	70	100
				Other Department-2						6	30	70	100

		SEC		Choose any one SEC from the list provided for Semester IV						2	30	70	100
				Total credits						20			
		Exit with B.Sc./B.A. Diploma and Entry with B.Sc. Diploma for B.Sc. Degree											

		Discipline Specific Elective (DSE) – Choose any number of the following from Mathematics Discipline											
7	V	DSE	MAT7101T	Geometry	6	-	-	90	6	6	30	70	100
			MAT7102T	Numerical Methods and L.P.P.	6	-	-	90	6	6	30	70	100
				Other Department -1						6			
				May be from another Departments-2						6			
		SEC		Choose any one SEC from the list provided for Semester V						2	30	70	100
				Total credits						20			
		Discipline Specific Elective (DSE) – Choose any number of the following from Mathematics Discipline											
	VI	DSE	MAT7103T	Transform Analysis	6	-	-	90	6	6	30	70	100
			MAT7104T	Mechanics	6	-	-	90	6		30	70	100
				Other Department -1						6			
				May be from another Departments-2						6			
		SEC		Choose any one SEC from the list provided for Semester VI						2	30	70	100
				Total credits						20			
		Exit with B.Sc. Degree											

Note: One AEC with Semester I and II each. One SEC with Semester III, IV, V and VI each.

Credits to be Earned in B.Sc. Three Years Program

Course type	Total Credits in individual Discipline, AEC & SEC	Semester I	Semester II	Semester III	Semester IV	Semester V	Semester VI
	DCC - 72 (24+24+24) DSE - 36 (18+18)	DCC – 18 credits	DCC – 18 credits	DCC – 18 credits	DCC – 18 credits	DSE – 18 credits	DSE – 18 credits
	AEC – 04 (2+2)	AEC -2 credits	AEC -2 credits	SEC -2 credits	SEC -2 credits	SEC -2 credits	SEC -2 credits
	SEC – 08 (4+4)						
	Total 120 Credits	20	20	20	20	20	20

Note: One AEC with Semester I and II each. One SEC with Semester III, IV, V and VI each.

Note. Those courses in which no practical classes assigned than Total Lectures per week will be six andcredits also 06 for UG Programs.

The examination of all AEC can't be conducted by one paper therefore faculty wise code is suggested for AEC Courses in Arts, Commerce andScience Faculty as given below.

Faculty of Arts (1)	Faculty of **Commerce (2)**	Faculty of **Science (3)**
General Hindi - AEN5111T	General Hindi - AEN5211T	General Hindi - AEN5311T
General English – AEN5112T	General English – AEN5212 T	General English – AEN5312 T
Environmental Science - AEN5113T	Environmental Science - AEN5213T	Environmental Science - AEN5313T

Note : Code for SES already allotted with slots and procedure

DEPARTMENT OF MATHEMATICS AND STATISTICS
JAI NARAIN VYAS UNIVERSITY:JODHPUR

B.Sc. / B.A. Mathematics

Examinations 2024, 2025 & 2026

Sr. No.	Level	Seme-ster	Course Code	Type of Course	Title	Total Marks	Teaching Hours Per Week			Credits
							L	T	P	
1	5	I	MAT5001T	DCC	Calculus	100	6	-	-	6
2	5	II	MAT5002T	DCC	Algebra	100	6	-	-	6
Exit with B.Sc. Certificate and Entry with B.Sc. Certificate for B.Sc. Diploma										
3	6	III	MAT6001T	DCC	Differential Equation	100	6	-	-	6
4	6	IV	MAT6002T	DCC	Analysis	100	6	-	-	6
Exit with B.Sc. Diploma and Entry with B.Sc. Diploma for B.Sc. Degree										
5	7	V	MAT7101T	DSE	Geometry	100	6	-	-	6
	7	V	MAT7102T	DSE	Numerical Methods and L.P.P.	100	6		-	6
6	7	VI	MAT7103T	DSE	Transform Analysis	100	6	-	-	6
	7	VI	MAT7104T	DSE	Mechanics	100	6		-	6
			Exit with B.Sc. Degree							

Annexure – I

B.Sc. / B.A. Mathematics Semester: I, 2023-24

Discipline Centric Core Course (DCC)

MAT5001T: CALCULUS

(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Apply the concept and principles of differential calculus to find the curvature, concavity and points of inflection, envelopes, rectilinear asymptotes (Cartesian & parametric form only) of different curves.
- Trace standard curves in Cartesian and polar form.
- The student has knowledge of central concepts directional derivative; gradient; multiple integrals; line and surface integrals; vector fields; divergence, curl; the theorems of Green and Stokes and Gauss theorem.

SYLLABUS

Unit-I: Polar Co-ordinates, Angle between radius vector and the tangent, Pedal equation of a curve, Derivatives of an arc, curvature, Centre of curvature and chord of curvature.

Unit-II: Partial differentiation, Euler's theorem on homogeneous functions, chain rule of partial differentiation, Maxima and Minima of functions of two independent variables and of three variables connected by a relation, Lagrange's Method of undetermined multipliers.

Unit-III: Asymptotes, Singular points, curve tracing (Cartesian and polar form), Envelopes and evolutes, Theory of Beta and Gamma functions, Rectification.

Unit -IV: Volumes and Surfaces of solids of revolution, Differentiation and integration under the sign of integration, Double and triple integrals with applications volume and surface area, Dirichlet's integral, Change of order of integration and changing the double integral into polar co-ordinates.

Unit -V: Vector Calculus: Curl, Gradient, Divergence and Identities involving these operators. Stoke, Green and Gauss Theorems (Statement, application and verification only).

SUGGESTED BOOKS

- **Gorakh Prasad:** A Text Book of Differential Calculus; Pothishala Pvt..Ltd.Allahabad.
- **J.L. Bansal, S.L.Bhargava and S.M. Agarwal :** A Text Book of Differential Calculus II (Hindi Ed.) and Integral Calculus, Vol. II (Hindi Ed.); Jaipur Publishing House, Jaipur.
- **D.C. Gokharoo & S.R. Saini:** Differential Calculus (Hindi Ed.); Navkar Prakashan, Ajmer.
- **O.P.Tandon, and Sharma, K.C.:** Integral Calculus; Jaipur Publishing House, Jaipur.
- **Gupta, Juneja and Tandon:** Differential Calculus (English Ed.);Ramesh Book Depot, Jaipur.
- **Gorakh Prasad:** Integral Calculus; Pothishala Pvt. Ltd. Allahabad.
- **D.C. Gokhroo, S.R. Saini, S.S.Bhati :** Vector Calculus (Hindi Ed.); Navkar Prakashan,Ajmer.
- **S.L.Bhargava, Banwari Lal:** Vector Calculus (Hindi Ed.); Jaipur Publishing House, Jaipur.
- **Goswami, M.**P. & others : Differential Calculus; Neelkanth publisher, Jaipur.

- **Goswami, M.**P. & others : Integral Calculus; Neelkanth publisher, Jaipur.

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

B.Sc. / B.A. Mathematics Semester : II, 2023-24

Discipline Centric Core Course (DCC)

MAT5002T: ALGEBRA

(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- This course aims to provide a first approach to the subject of algebra, which is one of the basic pillars of modern mathematics.
- The course will help prepare you for further study in abstract algebra as well as familiarize you with tools essential in many other areas of mathematics. The other aim of this module is to provide the learner with the skills, knowledge and competencies to carry out their duties and responsibilities in a pure Mathematics environment.

SYLLABUS

Unit-I: Rank of Matrix, The characteristic equation of a matrix, Eigen values and Eigen vectors, Cayley-Hamilton theorem and its use in finding the inverse of a matrix, Reduce the matrix into normal form.

Unit II: Relations between the roots and coefficients of general polynomial equations in one variable.Symmetric function of roots, Transformation of equations, Descarte's rule of signs, Solution of cubic equations (Cardon's method), Biquadratic equations (Ferrari's Method).

Unit-III: Definition and general properties of groups, Order of an element of a group, Cyclic group, Permutation group, Subgroups, Index of a subgroup, Theorems on Subgroups of a cyclic group.

Unit-IV: Cosets, Lagrange's theorem, Group homomorphism, Cayley theorem, Normal subgroups, quotient Groups, Fundamental theorem of homomorphism, Basic concepts of Ring, Field and Integral domain.

Unit-V: Vector Space: Definition and examples of a vector space, subspace, Linear combination and linear span, Linear dependence and independence of vectors.

SUGGESTED BOOKS

- **M. Ray:** A Text Book of Higher Algebra, S.Chand & Co., New Delhi.
- **J.L. Bansal, S.L. Bhargva, & S.M. Agarwal:** Algebra (Hindi Ed.), Jaipur Publishing House, Jaipur.
- **A.R. Vasishta and A.K. Vasistha:** Matrices, Krishna Prakashan Ltd. Meerut.
- **G.C. Sharma:** Modern Algebra; Ram Prasad & Sons, Agra.
- **J.L. Bansal & S.L. Bhargava :** Abstract Algebra (Hindi Ed.); Jaipur Publishing House, Jaipur.
- **R.S. Agarwal.:** Text Book on Modern Algebra; S. Chand & Co., New Delhi.
- **D.C. Gokhroo & S.R.Saini:** Abstract Algebra (Hindi Ed.); Jaipur Publishing House, Jaipur.

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

Annexure - II

B.Sc. / B.A. Mathematics Semester : III, 2024-25

Discipline Centric Core Course (DCC)

MAT6001T: DIFFERENTIAL EQUATIONS

(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Will be able to explain the concept of differential equation.
- Classifies the differential equations with respect to their order and linearity.
- Explains the meaning of solution of a differential equation.
- Will be able to find solution of higher-order linear differential equations.

SYLLABUS

Unit-I: Exact and reducible to exact differential equations of first order and first degree. First order higher degree differential equations solvable for x,y,p. Clairaut's form and singular solutions.

Unit-II: Linear differential equations with constant coefficients, Homogeneous linear differential equations with variable coefficients. Simultaneous differential equations, Total differential equations of the form Pdx + Qdy + Rdz = 0, by method of inspection and method for homogeneous equations.

Unit-III: Linear differential equations of second order of the form $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$. Exact Linear differential equations of n^{th} order. Differential equations of the various forms e.g., (i) $\frac{d^2y}{dx^2} = f(y)$ (ii) Equations not containing y directly (iii) Equations not containing x directly. Method of variation of parameters to the solution of second order linear differential equations.

Unit-IV: Series solutions of Second Order Linear differential equations, Power series method, Series solution of Bessel and Legendre equations. Partial differential equations of the first order. Lagrange's form. Some special types of equations which can be solved easily by methods other than the general method. Charpit (general) method of solution.

Unit-V: Partial differential equations of second and higher order. Homogeneous and non-homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients. Monge's method of for the solution of equation of type Rr + Ss + Tt = V.

SUGGESTED BOOKS

- **Sharma, Gupta :** Differential Equations; Krishna Prakashan, Meerut.
- **Ray, Chaturvedi :** Differential equations; Kedar Nath, Ram Nath & co., Agra.
- **J.L.Bansal, H. S. Dhami :** Differential equations (Vol. II); Jaipur Publishing House, Jaipur.
- **D.C.Gokhroo, S.R. Saini and R.K. Kumbhat:** Differential equations (Hindi Ed.);Navkar Prakashan, Ajmer.
- **Gokhroo, Saini and Oza :** Partial differential equations; Jaipur Publishing House, Jaipur.

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

B.Sc. / B.A. Mathematics Semester : IV, 2024-25

Discipline Centric Core Course (DCC)

MAT6002T: ANALYSIS

(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- think about the basic proof techniques and fundamental definitions related to the real number system. They can demonstrate some of the fundamental theorems of analysis.
- Identify curves and regions in the complex plane defined by simple expressions.
- Describe basic properties of complex integration and having the ability to compute such integrals.
- Decide when and where a given function is analytic and be able to find it series developement.

SYLLABUS

Unit-I: Real Number System: Dedekind's theory of Real numbers, upper and lower bounds, limiting points, Bolzano-Weierstress theorem, derived sets, denumerable sets, enumerable sets, open and closed sets.

Riemann Integral: Theory of Riemann integration, necessary and sufficient conditions for R-integrability, Darboux theorem.

Unit-II: Test of convergence of infinite series: Cauchy's root test, Logarithmic Ratio Test, Raabe's test, De Morgen and Bertrand's test, Cauchy's condensation test, Gauss's test. Alternating series, Leibnitz test (Derivation of above tests not required), Convergent series, tests for convergence of a series: comparison test, D'Alembert's Ratio test.

Unit-III: Complex Analysis: Functions, Limits, and continuity. Differentiability, Concept of an analytic function, Cartesian and Polar form of Cauchy-Riemann equations. Harmonic function, Conjugate function, Construction of analytic functions. Power Series: Absolute convergence of power series, circle and radius of convergence of power series, sum function of a power series.

Unit-IV: Complex integration: Complex integration as the sum of two line integrals, Cauchy integral theorem, Cauchy's integral formula, Cauchy's integral formula for the derivative of an analytic function, Application of Cauchy's integral formula.

Unit-V: Morera's Theorem. Liouville's Theorem, Poisson's integral formula. Expansion of analytic function by Taylor's and Laurent's theorems. Singularities of an analytic function, types of singularities.

SUGGESTED BOOKS

- **Shanti Narayan:** Real Analysis; S.Chand & Co., New Delhi.
- **G.N.Purohit:** Real Analysis; Jaipur Publishing House, Jaipur.
- **S.L. Bhargava, S.P. Goyal:** Real Analysis (Hindi Ed.); Jaipur Publishing House, Jaipur.
- **Shanti Narayan:** Theory of Functions of a Complex Variable; S.Chand & Co., New Delhi.
- **K.P.Gupta:** Complex Analysis; Pragati Prakashan, Meerut
- **D.C. Gokhroo, S.R. Saini & G.R. Yadav:** Complex Analysis (Hindi Ed.); Navkar Publication, Ajmer.
- **G.N. Purohit:** Complex Analysis; Jaipur Publishing House, Jaipur.
- **S. Ponnusamy:** Foundations of Complex Analysis, Narosa Publishing House, Bombay, New Delhi.
- **V. Karunakaran:** Complex Analysis, Narosa Publishing House. Bombay, New Delhi (2002).

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

Annexure – III

B.Sc. / B.A. Mathematics Semester : V, 2025-26
Discipline Specific Elective (DSE)

MAT7101T: GEOMETRY
(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Identify and describe 2D and 3D shapes. Analyze, compare, create, and compose shapes.
- Identify shapes as two-dimensional or three-dimensional.
- understand geometrical terminology for angles, triangles, quadrilaterals and circles.

SYLLABUS

Unit-I: Polar equation of a conic, polar equations of tangent, normal, asymptotes, chord of contact, auxiliary circle, director circle of a conic and related problems. General equation of second degree. Nature of conic, Tracing of conics (Cartesian coordinates).

Unit-II: Sphere: Definition, Plane section of a sphere, sphere through the circle of intersection of two spheres, power of a point, tangent plane, polar plane, polar line, angle of intersection of two spheres, length of tangent, radical plane, radical axis, coaxial system of spheres and limiting points.

Cone: Definition, enveloping cone, intersection of a line and a cone, tangent plane of a cone, condition of tangency, reciprocal cone, angle between the lines in which a plane cuts the cone, three mutually perpendicular generators and right circular cone.

Cylinder: Definition, enveloping cylinder, equation of enveloping cylinder, right circular cylinder.

Unit-III: The Central Conicoids (referred to principal axes). Tangents and tangent planes, Polar planes and polar lines, Section with a given centre, Enveloping cone and Enveloping cylinder of conicoids.

Unit -IV: Equations of the normal to an ellipsoid, number of normals from a given point to an ellipsoid, Cone through six normals, Conjugate diameter and diametral planes and their properties. Cone as a Central surface. Paraboloids.

Unit -V: Plane Sections of Conicoids: Nature of the plane section of a central conicoid, circular sections of the conicoid and central conicoid, ellipsoid, hyperboloid, paraboloid, Umbilics, Generating lines of hyperboloid of one sheet and its properties.

SUGGESTED BOOKS

- **R.J.T. Bell:** Coordinate Geometry of Three dimensions; Macmillan India Ltd., New Delhi.
- **Vasistha, Agarwal :** Analytical Solid Geometry; Pragati Prakashn, Meerut.
- **Gokhroo, Saini & Rathi:** Analytical 3-D Geometry (Hindi Ed);Jaipur Pub. House, Jaipur.
- **J.L. Bansal, S.L. Bhargva & S.M. Agarwal :** 3-D Coordinate Geometry II; Jaipur Pub. House, Jaipur.
- **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.
- **D.C. Gokhroo, S.R. Saini & J.P.N. Ojha :** 2-D Geometry (Hindi Ed.), Navkar Publication,Ajmer.

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

B.Sc. / B.A. Mathematics Semester : V, 2025-26
Discipline Specific Elective (DSE)

MAT7102T: NUMERICAL METHODS AND L.P.P.
(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
- Apply numerical methods to obtain approximate solutions to mathematical problems.
- The main objective of linear programming is to maximize or minimize the numerical value. It consists of linear functions which are subjected to the constraints in the form of linear equations or in the form of inequalities.

SYLLABUS

Unit-I: Difference operators and factorial notation, Differences of polynomial, Newton's formulae for forward and backward interpolations. Divided differences, relation between divided differences and Simple difference. Newton's general interpolation formulae, Lagrange interpolation formula.

Unit-II: Central differences, Gauss, Stirling and Bessel interpolation formulae. Numerical Differentiation. Numerical integration, Trapezoidal, Simpson's and Weddle's rules.

Unit-III: Solution of linear difference equations with constant and variable coefficients. A Real root of Algebraic and Transcendental equations using by Bisection, Regula Falsi and Newton Raphson methods.

Unit-IV: Convex sets and their properties. Introduction to linear programming problems, The simplex technique to solve L.P.P (slack, surplus and artificial variable).

Unit-V: The simplex technique: Big M-method. **Duality:** Concept of duality in linear programming, Framing of dual programming, Elementary theorems of duality.

SUGGESTED BOOKS

- **D.C. Gokhroo & S.R. Saini:** Linear Programming (Hindi Ed.), Navkar Prakashan, Ajmer.
- **Mittal, Sethi:** Linear Programming, Pragati Prakashan, Meerut.
- **Goyal, Mittal:** Numerical Analysis, Prograti Prakashan, Meerut.
- **J.L.Bansal, S.L. Bhargava & S.M. Agarwal:** Numerical Analysis (Hindi Ed.),Jaipur Publishing House, Jaipur.
- **H.C. Saxena :** Numerical Analysis; S.Chand & Co., New Delhi
- **D.C. Gokhroo :** Numerical Analysis (Hindi Ed.);Navkar Prakashan, Ajmer
- **S.L. Bhargava, K.C. Sharma & S.S. Bhati:** Linear programming (Hindi Ed.), Jaipur Publishing House, Jaipur.

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

B.Sc. / B.A. Mathematics Semester : VI, 2025-26
Discipline Specific Elective (DSE)

MAT7103T: TRANSFORM ANALYSIS
(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Solve differential & integral equations with initial conditions using Laplace transform. Evaluate the Fourier transform of a continuous function and be familiar with its basic properties.
- The z-transform is the major mathematical tool for analysis in such areas as digital control and digital signal processing. 3. use of the Laplace transform gives rise to the basic concept of the transfer function of a continuous (or analog) system.

SYLLABUS

Unit-I: Laplace Transforms: Definition and existence of Laplace transform, Shifting theorems, Laplace transforms of derivatives and integrals, Laplace transforms of function multiply and divide by t^n, Laplace transform of periodic function, Inverse Laplace Transforms and its properties, Convolution theorem.

Unit-II: Applications of Laplace Transform to the solution of differential equations with constant coefficient and variable coefficient, Applications of Laplace Transform to the solution of difference equations and Boundary value problem.

Unit-III: Fourier Transform: Definition and properties of Fourier transform, Inverse Fourier transform, relation between Fourier and Laplace transform, Modulation Theorem, convolution of two functions, Parseval's identity, convolution theorem, Fourier transform of derivative.

Unit-IV: Applications of Fourier transform, Applications of Fourier transform to solve the BVP and the partial differential equation of second order.

Unit-V: Z-transform: Definition, change of scale and shifting property of z-transform, inverse z-transform, Application of z-transform to solution of difference equation, partial sum and convolution theorem of z-transform.

SUGGESTED BOOKS

- **Goyal, J.K. and Gupta, K.P. :** Laplace and Fourier transforms, Pragati Prakashan.
- **H.K. Dass:** Advanced Engineering Mathematics, S.Chand Pvt. Ltd., New Delhi.
- **Goyal, S.P. and Goyal, A.K.:** Integral transform, Jaipur publishing House.

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

B.Sc. / B.A. Mathematics Semester : VI, 2025-26
Discipline Specific Elective (DSE)

MAT7104T: MECHANICS
(30 CA + 70 End Sem. = Max. Marks: 100)

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
6 Credits	6 Hours	90 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Understand and use basic terms for the description of the motion of particles, vector functions and the fundamental laws of Newtonian mechanics. solve mechanics problems in one dimension that involve one or more of the forces of gravity, friction and air resistance

SYLLABUS

Unit-I: Resultant and equilibrium of coplanar forces acting on a rigid body. Friction.

Unit -II: Stable and Unstable equilibrium. Forces in three dimensions, Poinsot's central axis, Wrenches. Virtual work and common catenary.

Unit-III: Velocities and accelerations along radial and transverse directions and along tangential and normal directions. Simple harmonic motion and motion under inverse square law.

Unit-IV: Definition of moment and product of inertia, moment and product of inertia of rectangular, square and triangular leminas, circular and elliptic plates, moment and product of inertia of sphere and cone.

Unit-V: D'Alembert principle, general equation of motion of rigid body, motion of center inertia and motion relative to centre of inertia, motion about a fixed axis under finite force.

SUGGESTED BOOKS

- **S.L. Loney:** Rigid Body Dynamics; Cambridge Univ. Press.
- **P.P.Gupta:** Rigid Body Dynamics, Vol. I; Krishna Prakashan, Mandir, Meerut.
- **J.L.Bansal:** Rigid Body Dynamics; Jaipur Publishing House, Jaipur.
- **R.S. Verma:** A Text Book on Statics; S. Chand & Co., New Delhi.
- **S.L. Loney:** Dynamics of a particle & Rigid bodies.
- **M.Ray:** A Text book on Dynamics; S. Chand & Co., New Delhi.
- **D.C.Gokhroo, S.R. Saini & G.R.Yadav:** Higher Dynamics II (Hindi Ed.); Navkar Prakashan, Ajmer.
- **S.L. Bhargava & S.M.Agarwal:** Dynamics (Hindi Ed.);Jaipur Publishing House, Jaipur.
- **S.L. Bhargava, S.M.Agarwal & V.G. Gupta:** Statics (Hindi Ed.); Jaipur Publishing House, Jaipur.
- **Gokhroo:** Statics (Hindi Ed.): Navkar Prakashan, Ajmer.

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