

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: 2024-25

Level	Sem.	Course Type	Course Code	Course Title	L	P	H/W	Total Hours	Credits	Total Credits	Sessional Marks	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	General 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	General Hindi	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													



Professor & Head
Department of Mathematics & Statistics
JNV University, Jodhpur

B.Sc. / B.A. Mathematics Semester: I, 2024-25
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
<p>Course Outcome: On successful completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • 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		
<p>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.</p>		
<p>Unit-II: Partial differentiation, Euler's theorem and total differentiation, Maxima and Minima of functions of two independent variables and of three variables connected by a relation, Lagrange's Method of undetermined multipliers, Asymptotes.</p>		
<p>Unit-III: Singular points, curve tracing (Cartesian and polar form), Envelopes, Theory of Beta and Gamma functions.</p>		
<p>Unit -IV: Rectification, Volumes and Surfaces of solids of revolution, Differentiation under the sign of integration.</p>		
<p>Unit -V: Double and triple integrals with applications to volume and surface area, Dirichlet's integral, Change of order of integration and changing the double integral into polar co-ordinates. Curl, Gradient, Divergence, Stoke's, Green's and Gauss's Theorems (Statement, application and verification only).</p>		
SUGGESTED BOOKS		
<ul style="list-style-type: none"> • 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. <p>Note: Latest edition of textbooks and reference books may be used.</p>		



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B.Sc. / B.A. Mathematics Semester : II, 2024-25
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
<p>Course Outcome: On successful completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> 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		
<p>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.</p>		
<p>Unit II: Relations between the roots and coefficients of general polynomial equations in one variable. Symmetric functions of roots, Transformation of equations, Descarte's rule of signs, Solution of cubic equations (Cardon's method), Biquadratic equations (Ferrari's Method).</p>		
<p>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.</p>		
<p>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.</p>		
<p>Unit-V: Vector Space: Definition and examples of a vector space, subspace, Linear combination and linear span, Linear dependence and independence of vectors.</p>		
SUGGESTED BOOKS		
<ul style="list-style-type: none"> 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. 		
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