

ACADEMIC PLANNER XII - MATH (2024-25)

Date	No. of working Days	Chapter	Demo./Practicals/Teaching Strategies Mode of Assessment
APRIL 1-15	11	CH-MATRICES: Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restricted to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).	Gaming Method / /Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method
16-30	11	CH: DETERMINANTS- Determinant of a square matrix (up to 3 x 3 matrices), minors, cofactors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of systems of linear equations by examples, solving systems of linear equations in two or three variables (having unique solution) using inverse of a matrix.	Gaming Method / /Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method
MAY 1-15	12	CH: L.P.P. Introduction, related terminology such as constraints, objective function, optimization, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).	Use of Geogebra, Problem Solving Method
16-25	8	CH- INVERSE TRIGONOMETRIC FUNCTIONS: Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions. Properties of inverse trigonometric functions.	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab
JULY 1-15	12	CH- RELATIONS AND FUNCTIONS: Types of relations; reflexive, symmetric, transitive and equivalence relations. One to one and onto functions. Composition of functions and Invertible functions	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity
16-31	13	CH- CONTINUITY AND DIFFERENTIABILITY Continuity and differentiability, chain rule, derivative of inverse trigonometric functions, like $\sin^{-1} x$, $\cos^{-1} x$ and $\tan^{-1} x$, derivative of implicit	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab

		<p>functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives</p> <p>CLASS TEST - 2 (25 JULY TO 2 AUG 2022)</p>	Activity
AUG 1-15	11	<p>CH- APPLICATIONS OF DERIVATIVES</p> <p>Applications of derivatives: rate of change of bodies, increasing/decreasing functions,</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity</p>
16-31	12	<p>CH- APPLICATIONS OF DERIVATIVES (CONTD.) Maxima and Minima (First derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity</p>
SEP 1-15	11	<p>CH-INTEGRALS - Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts.</p> <p>INTERNAL ASSESSMENT/PRACTICAL - 1</p> <p>TERM -1 EXAM - 12 SEP. TO 30 SEP.</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method</p>
16-30	12	<p>CH-INTEGRALS - Evaluation of simple integrals of the following types and problems based on them.</p> $\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{az^2 + bx + c}, \int \frac{dx}{\sqrt{az^2 + bx + c}},$ $\int \frac{px+q}{az^2 + bx + c} dx, \int \frac{px+q}{\sqrt{az^2 + bx + c}} dx, \int \sqrt{a^2 \pm x^2} dx,$ $\int \sqrt{x^2 \pm a^2} dx, \int \sqrt{ax^2 + bx + c} dx$ <p>Fundamental Theorem of Calculus (without proof) Basic properties of definite integrals and evaluation of definite integrals.</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method</p>
OCT 1-15	9	<p>CH- APPLICATIONS OF THE INTEGRALS</p> <p>Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only). Area between two curves.</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method</p> <p>Use of Geogebra</p>
16-31	12	<p>CH-DIFFERENTIAL EQUATIONS</p> <p>Definition, order and degree, general and particular solutions of a differential equation.</p>	<p>Inducto-Deductive Method/ Analytico-Synthetic</p>

		<p>Formation of a Differential Equation whose general solution is given. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type:</p> $\frac{dy}{dx} + py = q, \text{ where 'p' and 'q' are functions of 'x' or constants}$ $\frac{dy}{dx} + py = q, \text{ where 'p' and 'q' are functions of 'y' or constants.}$	Method/Problem-solving Method
NOV 1-15	10	<p>CH-VECTORS Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.</p>	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity
16-30	13	<p>CH-THREE DIMENSIONAL GEOMETRY Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines. Plane, Coplanarity of Two lines, Angle between Two Planes, Distance of a Point from a Plane, Angle between a Line and a Plane.</p>	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity Use of Geogebra
DEC 1-15	11	<p>CH-PROBABILITY Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean of random variable.</p>	Inducto-Deductive Method/ Analytico-Synthetic Method/Problem-solving Method /Math Lab Activity
16-31	13	REVISION PRE BOARDS EXAMINATION	
UNIT TEST 1	CHAPTERS:3,4,12 (Starts: 15 July)		
HALF YEARLY	CHAPTERS:1,2,3,4,12 (Starts: 17 Sept)		
PRE - BOARD	CHAPTERS: 1-13 (Starts: 3 Dec)		