



Curriculum
Subject: Applied Mathematics (241)
Class: XII
Session: 2024-25

Month	April	May	June	July
Concepts	Ch.1 Numbers & Quantification Ch.2 Numerical Applications	Ch.3 Matrices and Determinants Ch.4 Derivatives and its application	Ch.5 Integration and its application Ch.6 Differential Equations	Ch.7 Probability
Learning Outcomes	Students will be able to <ul style="list-style-type: none"> ● Define and apply modulus of an integer. ● Define and apply congruence modulo. ● Understand the rule of alligation to produce a mixture at a given price. ● Determine the mean price of a mixture. ● Apply the rule of allegations. ● Distinguish between upstream and downstream. ● Express the problem in the form of an equation. ● Determine the time taken by two or more pipes to fill or empty the tank. ● Describe the basic concepts of numerical inequalities. ● Understand and write numerical inequalities. 	Students will be able to <ul style="list-style-type: none"> ● Define matrix & Identify different kinds of matrices. ● Find the size / order of matrices ● Determine equality of two matrices. ● Write transpose of given matrix ● Define symmetric and skew symmetric matrix. ● Perform operations like addition & subtraction on matrices of the same order. ● Perform multiplication of two matrices of appropriate order. ● Perform multiplication of a scalar with matrix. ● Find the determinant of a square matrix. ● Use elementary properties of determinants. ● Define and apply the inverse of a square matrix. ● Solve the system of simultaneous equations using <ol style="list-style-type: none"> i) Cramer's Rule ii) Inverse of coefficient matrix. ● Formulate real life problems into a system of simultaneous linear equations and solve it using these methods. ● Determine second and higher order derivatives. ● Understand differentiation of parametric functions and implicit functions. ● Determine the rate of change of various quantities. ● Understand the gradient of tangent and normal to a curve at a given point. ● Write the equation of tangents and normal to a curve at a given point. ● Define marginal cost and marginal revenue. ● Find marginal cost and 	Students will be able to <ul style="list-style-type: none"> ● Understand and determine indefinite integrals of simple functions as anti-derivative. ● Evaluate indefinite integrals of simple algebraic functions by method of: <ol style="list-style-type: none"> i) substitution ii) partial fraction iii) by parts ● Define a definite integral as the area under the curve. ● Understand the fundamental theorem of Integral calculus and apply it to evaluate the definite integral. ● Apply properties of definite integrals to solve the problems. ● Recognize a differential equation. ● Find the order and degree of a differential equation. ● Formulate differential equation. ● Verify the solution of differential equation. ● Solve simple differential equation. 	Students will be able to <ul style="list-style-type: none"> ● Understand the concept of Random Variables and its Probability Distributions. ● Find probability distribution of discrete random variable. ● Apply arithmetic mean of frequency distribution to find the expected value of a random variable, Standard deviation and Variance. ● Identify the Bernoulli Trials and apply Binomial Distribution. ● Evaluate Mean, Variance and S.D of a binomial distribution. ● Understand the Conditions of Poisson Distribution. ● Evaluate the Mean and Variance of Poisson distribution. ● Understand normal distribution is a Continuous distribution. ● Evaluate value of Standard normal variate. ● Area relationship between Mean and Standard Deviation.

		<p>marginal revenue.</p> <ul style="list-style-type: none"> ● Determine whether a function is increasing or decreasing. ● Determine the conditions for a function to be increasing or decreasing. ● Find the point(s) of local maxima and local minima and corresponding local maximum and local minimum values. ● Find the absolute maximum and absolute minimum value of a function. 		
Skills	Understanding/ Application/Critical thinking/ Problem solving	Understanding/ Application/Critical thinking/ Problem solving	Understanding/ Application/Critical thinking/ Problem solving	Understanding/ Application/Critical thinking/ Problem solving/Analysis
Activities	<p>Competency-skills based activity/Experiential Learning: Fibonacci sequence: Its' history and presence in nature.</p>			<p>Competency-skills based activity/Experiential Learning: Probability and dice roll simulation.</p>
Art Integration	Economics and Management Skills			
Assessment	<ul style="list-style-type: none"> ● Project work and record ● Year-end Presentation/ Viva of the Project <p>Main Book: 'Applied Mathematics' (ML Agarwal)</p>			



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Month	August	September	October	November	December
Concepts	Ch.9 Financial Mathematics	Ch.10 Inferential Statistics	Ch.11 Linear programming Ch.12 Time series	Ch.15 Logical Reasoning	Revision of complete syllabus with HOTS
Learning Outcomes	<p>Students will be able to</p> <ul style="list-style-type: none"> ● Explain the concept of perpetuity and sinking fund. ● Calculate perpetuity. ● Differentiate between sinking fund and saving account. ● Explain the concept of EMI. ● Calculate EMI using various methods. ● Explain the concept of rate of return and nominal rate of return. ● Calculate rate of return and nominal rate of return. ● Understand the concept of Compound Annual Growth Rate. ● Differentiate between Compound Annual Growth Rate and Annual Growth Rate Calculate Compound Annual Growth Rate. ● Define the concept of linear method of Depreciation. ● Interpret cost, residual value and useful life of an asset from the given information. 	<p>Students will be able to</p> <ul style="list-style-type: none"> ● Differentiate between population and sample. ● Differentiate between a representative and unrepresentative sample. ● Draw a representative sample using simple random sampling. ● Draw a representative sample using and systematic random sampling. ● Explain the relation between Parameter and Statistic. ● Explain the limitation of Statistics to generalize the estimation for population. ● Interpret the concept of Statistical Significance and Statistical Inferences. ● Explain the relation between Population-Sampling Distribution-Sample. ● Differentiate between Null and Alternate hypothesis. ● Define and calculate the degree of freedom. ● Test Null hypothesis and make inferences using t-test statistics for one group / two independent groups. 	<p>Students will be able to</p> <ul style="list-style-type: none"> ● Familiarize with terms related to Linear Programming Problem. ● Identify and formulate different types of LPP. ● Identify feasible, infeasible, bounded and unbounded regions. ● Understand feasible and infeasible solutions. ● Find optimal feasible solutions. ● Distinguish between different things. ● Components of time series. ● Solve practical problems based on statistical data and Interpret the result. ● Demonstrate the techniques of finding trends by different methods. 	<p>Students will be able to</p> <ul style="list-style-type: none"> ● Solve logical problems involving odd man out, syllogism, blood relation and coding decoding. 	<p>Students will be able to</p> <ul style="list-style-type: none"> ● To revise syllabus with HOTS
Skills	Understanding/ Application/Critical thinking/ Problem solving/Analysis	Understanding/ Application/Critical thinking/ Problem solving	Understanding/ Application/Critical thinking/ Problem solving	Understanding/ Application/Critical thinking/ Problem solving	

Activity	Competency-skills based activity/Experiential Learning : Logarithms for financial calculations such as interest, present value, future value, profit/loss etc. with large values).	Competency-skills based activity/Experiential Learning: Predicting stock market crash.	Competency-skills based activity/Experiential Learning: Weather prediction (prediction of monsoon from past data).		
Art Integration	Economics and Management Skills				
Assessment	<ul style="list-style-type: none"> ● Project work and record ● Year-end Presentation/ Viva of the Project <p>Main Book: 'Applied Mathematics' (ML Agarwal)</p>				