SANT NANDLAL SMRITI VIDYA MANDIR, GHATSILA

YEARLY SYLLABUS OF APPLIED MATHEMATICS

SESSION : 2025-2026

STD : XII Commerce

MONTH	NO. OF CLASSES	TOPIC TO BE TAUGHT	ACTIVITY	LEARNING OUTCOME	VALUES & SKILLS IMPARTED	ASSESSMENT
APRIL	21	**Perpetuity,** **Sinking Funds** **and** **EMI**	Stock Market data sheet on excel	**Students will be able to:** • 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	1. Perpetuity: Values: Long-term planning, sustainability. Skills: Calculating perpetual cash flows, understanding present values. 2. Sinking Funds: Values: Financial discipline, prudence. Skills: Managing funds for future expenses,	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions
		Returns, **Growth** **and** **Depreciation**		• 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 • Calculate depreciation **Topics of Assessment :** 1. Perpetuity, Sinking Funds & EMI 2. Returns, Growth and Depreciation	calculating contributions. 3. EMI (Equated Monthly Instalment): Values: Responsibility, budgeting. Skills: Understanding fixed loan payments, managing personal finances. 4. Returns: Values: Risk management, patience. Skills: Analysing investment options, evaluating returns.	* Assertion Reason Questions

					5. Growth: Values: Ambition, adaptability. Skills: Setting goals, tracking progress. 6. Depreciation: Values: Asset management, financial prudence. Skills: Calculating asset value decline, making informed decisions.	
MAY	09	**Numerical Inequalities**		• Describe the basic concepts of numerical inequalities • Understand and write numerical inequalities **Topics of Assessment :** 1. Numerical Inequalities	Numerical Inequalities: Values: Precision, logical reasoning. Skills: Solving and graphing inequalities, understanding	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done

					relationships between quantities, analysing numerical patterns, and making reasoned judgments about the relative sizes of numbers.	* MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
JUNE	11	**Differentiation**		• 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 **Topics of Assessment :** 1. Differentiation	Differentiation: Values: Precision, analytical thinking. Skills: Computing derivatives, understanding rates of change, analysing functions, solving optimization problems, and applying differentiation	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked

					techniques in various fields such as physics, economics, and engineering.	* Case study-based questions * Assertion Reason Questions
JULY	26	**Application of Derivatives**	Plot the graphs of functions on excel and study the graph to find out the point of maxima/minima	• Define marginal cost and marginal revenue • Find marginal cost and marginal revenue • Determine whether a function is increasing or decreasing • Determine the conditions for a function to be increasing or decreasing • Determine critical points of the function • 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 • Solve applied problems	Application of Derivatives: Values: Critical thinking, problem-solving. Skills: Finding extrema, understanding concavity, optimizing functions, modelling real-world phenomena, and interpreting the behaviour of functions in contexts such as economics, physics, and biology.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions

		Integrals		• Understand and determine indefinite integrals of simple functions as anti-derivative • Evaluate indefinite integrals of simple algebraic functions by method of : i) substitution ii) partial fraction iii) by parts • Define definite integral as area under the curve • Understand fundamental theorem of Integral calculus and apply it to evaluate the definite integral • Apply properties of definite integrals to solve the problems • Identify the region representing Consumer Surplus and Producer Surplus graphically • Apply the definite integral to find consumer surplus-producer surplus **Topics of Assessment :** 1. Application of Derivatives 2. Integrals	Integration: Values: Precision, patience. Skills: Computing antiderivatives, understanding areas under curves, calculating definite integrals, solving differential equations, and applying integration techniques in fields such as physics, engineering, and economics for solving problems related to accumulation, rates, and averages.	

AUGUST	24	**Differential Equations**		• 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 • Define Growth and Decay Model • Apply the differential equations to solve Growth and Decay Models	Differential Equations: Values: Persistence, modelling, critical thinking. Skills: Solving ordinary and partial differential equations, understanding stability and equilibrium, modelling dynamic systems in physics, engineering, and biology, and predicting future behaviour based on initial conditions and governing equations.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
		Probability	Probability and dice roll simulation	• Identify the Bernoulli Trials and apply Binomial Distribution • Evaluate Mean, Variance and Standard Deviation of a Binomial Distribution	Probability: Values: Objectivity, critical thinking.	* Exercise Questions & Answers to be assessed

				• 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 **Topics of Assessment :** 1. Differential Equations 2. Probability	Skills: Calculating probabilities, understanding random variables, interpreting probability distributions, applying concepts in real-world scenarios such as gambling, risk assessment, and decision-making under uncertainty.	* Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
SEPTEMBER	21	**Inferential Statistics**	Collect the data on weather, price, inflation, and pollution analyse the data and make meaningful inferences	• Define Population and Sample • Differentiate between population and sample • Define a representative sample from a population • Differentiate between a representative and non-representative sample • Draw a representative sample using simple random sampling • Draw a representative sample using and	Inferential Statistics: Values: Objectivity, scepticism. Skills: Making inferences about populations based on sample data, hypothesis testing, estimating	

				systematic random sampling • Define Parameter with reference to Population • Define Statistics with reference to Sample • Explain the relation between Parameter and Statistic • Explain the limitation of Statistic to generalize the estimation for population • Interpret the concept of Statistical Significance and Statistical Inferences • State Central Limit Theorem • Explain the relation between Population-Sampling Distribution-Sample • Define a Hypothesis • Differentiate between Null and Alternate hypothesis • Define and calculate degree of freedom • Test Null hypothesis and make inferences using t-test statistic for one group / two independent groups **Topics of Assessment :** 1. Inferential Statistics	parameters, understanding confidence intervals, and interpreting statistical significance to draw conclusions and make informed decisions in research, business, and social sciences.	

		Revision & Half Yearly Exam				
OCTOBER	18	**Matrices**	Matrix multiplication and the inverse of a matrix	• 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 same order • Perform multiplication of two matrices of appropriate order • Perform multiplication of a scalar with matrix	Matrices: Values: Systematic thinking, abstraction. Skills: Manipulating matrices, solving systems of linear equations, understanding transformations, calculating determinants and inverses, and applying matrix operations in various fields such as computer graphics, physics, and economics for representing and analysing complex data and relationships.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
NOVEMBER	23	**Determinants**		• Find determinant of a square matrix • Use elementary properties of determinants	Determinants: Values: Precision,	

				• Define the inverse of a square matrix • Apply properties of inverse of matrices • Solve the system of simultaneous equations using i) Cramer's Rule ii) Matrix Method / Marin's Rule (Inverse of coefficient matrix) • Formulate real life problems into a system of simultaneous linear equations and solve it using these methods **Topics of Assessment :** 1. Matrices 2. Determinants	attention to detail. Skills: Calculating the determinant of a square matrix, understanding properties of determinants, using determinants to solve systems of linear equations, and applying determinant-based methods in linear algebra, geometry, and calculus for analysing the properties and behaviour of mathematical systems	
DECEMBER	19	**Numbers, Quantification and Numerical Applications**		• Define Modulus of an integer • Apply arithmetic operations using Modular Arithmetic Rules • Define Congruence Modulo	Numbers, Quantification, and Numerical Applications: Values: Accuracy, precision.	* Exercise Questions & Answers to be assessed * Questions from other reference

				• Apply the definition in various problems • Understand the rule of Alligation to produce a mixture at a given price • Determine the mean price of a mixture • Apply rule of Alligation • 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 • Compare the performance of two players w.r.t. Time, Distance • Describe the basic concepts of Numerical Inequalities • Understand and write Numerical Inequalities **Topics of Assessment :** 1. Numbers, Quantification and Numerical Applications	Skills: Understanding numerical concepts, performing calculations, quantifying relationships and data, applying numerical methods in various contexts such as finance, science, engineering, and everyday problem-solving.	books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
		Time Based Data **(Moving Averages)**	Collect data from newspapers on traffic, sports	• Identify time series as chronological data	Time-Based Data (Moving Averages):	* Exercise Questions &

			activities and market trends and use excel to study future trends	• Distinguish between different components of time series • Solve practical problems based on statistical data and interpret the result • Understand the long-term tendency • Demonstrate the techniques of finding trend by different methods **Topics of Assessment :** 1. Time Based Data (Moving Averages)	Values: Attention to trends, adaptability. Skills: Analysing sequential data over time, calculating moving averages to smooth out fluctuations, identifying patterns and trends, and making informed decisions based on historical data in fields such as finance, economics, and weather forecasting.	Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case study-based questions * Assertion Reason Questions
JANUARY	22	**Revision & Pre-Board Exam**				
FEBRUARY	22	**Board Exam**				

Subject Teacher : AMIT KUMAR MAHAPATRA **Principal**