Government City College (A)
Hyderabad-500002
(Affiliated to Osmania University)
Accredited with B^{++} Grade by NAAC
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Department of Mathematics and Statistics

COURSE OUTCOMES:

Course Title: Differential and Integral calculus

On Completion of this course the students will be able to:

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall and list the fundamental concepts and techniques of calculus, including partial differentiation, total differentiation, curvature, evolutes, double and triple integrals, Taylor's theorem, and maxima and minima.	Remembering
CO2	Interpret the geometric significance of double and triple integrals in representing volume and mass calculations. Understand Taylor's theorem and its role in approximating functions using polynomial expansions. Comprehend the concepts of maxima and minima and their importance in optimization problems	Understanding
CO3	Utilize double and triple integrals to compute volumes, areas, and other quantities in both Cartesian and polar coordinates	Applying
CO4	Analyze the geometric properties of curves, surfaces, and volumes using calculus techniques, including curvature calculations and understanding how evolutes are derived.	Analyzing
CO5	Synthesize concepts from differential and integral calculus to solve complex problems in mathematics, engineering, physics, and other fields.	Creating

Course Title: Differential Equations

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

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Memorize key definitions, theorems, and solution techniques for various types of differential equations.	Remembering
CO2	Explain the concepts of first-order and first- degree differential equations and their applications in modeling real-world phenomena Interpret the characteristics and behavior of higher-order differential equations, including linear and nonlinear equations.	Understanding
CO3	Apply solution techniques such as separation of variables, integrating factors, and exact equations to solve first-order and first-degree differential equations. Solve simple partial differential equations using separation of variables and other basic techniques.	Applying
CO4	Analyze the properties and solutions of higher- order differential equations with constant coefficients	Analyzing
CO5	Construct solutions to complex problems involving first-order and higher-order differential equations, demonstrating creativityand critical thinking skills	Creating

Course Title: Abstract Algebra

After completing the course students are expected to be able to:

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall and list the fundamental definitions and concepts of abstract algebra, including groups, rings, fields, and homomorphism. Memorize key theorems, properties, and examples related to various algebraic structures.	Remembering
CO2	Interpret theorems and results concerning algebraic structures, including the Lagrange's theorem, Cayleys Theorem and the fundamental theorem of homomorphisms.	Understanding
CO3	Utilize subgroup and coset relationships to analyze the structure of groups and rings. Apply homomorphisms and isomorphisms to establish relationships between algebraic structures and simplify calculations	Applying
CO4	Examine the properties of integral domains, Euclidean domains, and polynomial rings, and their applications in number theory and algebraic geometry.	Analyzing
CO5	Develop new perspectives and approaches to studying algebraic structures and their applications in various branches of mathematics and beyond	Creating

Course Title: Mathematical Analysis

After completing the course students are expected to be able to:

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall and list the fundamental definitions and concepts of mathematical analysis, including limits, continuity, differentiability, and integrability. Memorize key theorems, definitions, and properties related to real numbers, sequences, and functions	Remembering
CO2	Understand the concepts of convergence and divergence of sequences and series, and their significance in calculus and real analysis Interpret theorems and results concerning the properties and behavior of real-valued functions, including the intermediate value theorem and the mean value theorem	Understanding
CO3	Apply the principles of mathematical analysis to solve problems involving limits, continuity, and differentiability of functions	Applying
CO4	Analyze the behavior of functions using mathematical analysis techniques, including determining local and global extrema, inflection points.	Analyzing
CO5	Develop new perspectives and approaches to studying real analysis and its applications in various branches of mathematics and other disciplines	Creating

Course Title: Linear Algebra

After completing the course students are expected to be able to:

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall and list the fundamental definitions and concepts of linear algebra, including vector spaces, linear transformations, matrices, and eigenvalues/eigenvectors. Memorize key theorems, properties, and algorithms related to solving systems of linear equations and matrix operations.	Remembering
CO2	Explain the basic properties and axioms of vector spaces and subspaces, and their significance in linear algebra Understand the concepts of linear transformations and their representations by matrices, including the kernel and image of a linear transformation.	Understanding
CO3	Utilize matrix operations and properties to analyze and solve problems involving linear transformations and change of basis	Applying
CO4	Examine the geometric interpretations of linear algebra concepts, including the relationship between linear independence, spanning sets, and bases. Analyze the properties and behavior of linear transformations, including rank-nullity theorem and matrix representations.	Analyzing
CO5	Develop new perspectives and approaches to studying linear algebra and its applications in various branches of mathematics, physics, computer science, and engineering	Creating

COURSE TITLE: Numerical Analysis

After completing the course students are expected to be able to:

S.No	Course Outcomes	Blooms Taxonomy Classification
CO1	Memorize key formulas, theorems, and properties related to numerical methods and their applications in solving mathematical problems.	Remembering
CO2	Explain the principles behind numerical approximation and its importance in solving mathematical problems that are difficult or impossible to solve analytically.	Understanding
CO3	To derive numerical methods for various mathematical operations and tasks, such as Interpolation, differentiation, Integration.	Applying
CO4	To establish the limitations, advantages and disadvantages of Numerical analysis	Analyzing
CO5	Synthesize concepts from numerical analysis to develop new computational techniques and improve existing algorithms for solving complex mathematical problems	Creating