

GOVERNMENT COLLEGE FOR MEN, SRIKAKULAM
(NAAC 'B+' Grade College.)
(Affiliated to Dr. B. R. Ambedkar University, Srikakulam)

DEPARTMENT OF MATHEMATICS

**PROGRAM OUTCOMES,
PROGRAM SPECIFIC OUTCOMES
AND
COURSE OUTCOMES**

SEM-1: DIFFERENTIAL EQUATIONS

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO.1.Solve linear differential equations.
- CO.2.Convert non exact homogeneous equations to exact differential equations by using integrating factors.
- CO.3.Understand methods for finding solutions of differential equations of the first order but not of the first degree.
- CO.4.Solve higher-order linear differential equations, both homogeneous and non-homogeneous, with constant coefficients.
- CO.5.Understand the concepts and apply appropriate methods for solving differential equations.

SEM-2: THREE-DIMENSIONAL ANALYTICAL SOLID GEOMETRY

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO.1. Gain Knowledge of Planes: Understand the concept of planes in geometry. Identify and describe different types of planes and their properties.
- CO.2. Acquire Basic Ideas of Lines, Spheres, and Cones: Comprehend the basic definitions and properties of lines, spheres, and cones. Recognize and classify various geometric figures including lines, spheres, and cones.
- CO.3.Understand the Properties of Planes, Lines, Spheres, and Cones: Analyse and explain the properties and relationships between planes, lines, spheres, and cones. Apply geometric principles to solve problems involving these figures.
- CO.4.Express Problems Geometrically and Find Solutions: Translate real-world problems into geometric representations. Use geometric methods and reasoning to find solutions to these problems.

SEM-3: ABSTRACT ALGEBRA

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO. 1. Acquire the basic knowledge and structure of groups, subgroups, and cyclic groups.
- CO.2. Get the significance of the notation of a normal subgroup.
- CO. 3. Get the behavior of permutations and operations on them.
- CO. 4. Study the homomorphisms and isomorphisms with applications.
- CO.5. Understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems and various fields.

SEM-4: REAL ANALYSIS

COURSE OUTCOMES:

After successful completion of this course, the student will be able to

- CO.1.Get clear idea about the real numbers and real valued functions.
- CO.2.Obtain the skills of analyzing the concepts and applying appropriate methods
for testing convergence of a sequence/ series.
- CO.3.Test the continuity and differentiability and Riemann integration of a function.
- CO.4. Know the geometrical interpretation of mean value theorems.

SEM-5: PAPER-5: RING THEORY & VECTOR CALCULUS

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO.1. Understand and apply the foundational concepts of ring theory and vector calculus, including the structure and properties of rings and the operations of gradient, divergence, and curl.
- CO.2. Comprehend and utilize key theorems in both areas, such as the Correspondence Theorem in ring theory and Green's, Stokes', and the Divergence Theorems in vector calculus, to solve complex mathematical problems.
- CO.3. Master integration techniques for both line and surface integrals in vector calculus, and understand factorization and ideal structures in ring theory, enabling the application of these concepts to various practical problems in physics, engineering, and algebraic structures.
- CO.4. Develop strong analytical and problem-solving skills by applying concepts from both ring theory and vector calculus to interdisciplinary problems, enhancing the ability to tackle advanced topics in mathematics and related fields.

SEM-5: PAPER-6: LINEAR ALGEBRA

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO.1. Understand the concepts of vector spaces, subspaces, basis, dimension, and their properties
- CO.2. Understand the concepts of linear transformations and their properties
- CO.3. Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods
- CO.4. Learn the properties of inner product spaces and determine orthogonality in inner product spaces.

SEM-6: PAPER-7: NUMERICAL ANALYSIS

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO.1. Understand and apply various numerical methods for solving mathematical problems, including root-finding algorithms, interpolation, and numerical differentiation and integration.
- CO.2. Develop the ability to analyze and estimate errors in numerical computations, understanding the sources of error and their impact on the accuracy and stability of numerical solutions.
- CO.3. Gain proficiency in solving linear systems using numerical techniques such as Gaussian elimination, LU decomposition, and iterative methods, and comprehend their applications in engineering and science.
- CO.4. Learn and implement numerical methods for solving ordinary differential equations (ODEs) and partial differential equations (PDEs), and understand their significance in modeling and solving real-world problems in various disciplines.
- CO.3. Utilize integral transforms to solve real-world problems in engineering, physics, and applied mathematics, such as signal processing, heat conduction, and wave propagation.
- CO.4. Develop strong analytical skills to perform detailed analysis and interpretation of transform results, facilitating the understanding of the behavior of systems and functions in various domains.



