

GOVERNMENT DEGREE COLLEGE MANDAPETA

B.SC. MATHEMATICS COURSE OUTCOMES

DIFFERENTIAL EQUATIONS

- CO-1:** Able to solve first order differential equations
- CO-2:** Able to perform step-by-step analysis to solve the differential equations using an appropriate method.
- CO-3:** Create and analyze mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits.
- CO-4:** Evaluate first order differential equations including separable, homogeneous, exact, and linear.

THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY

- CO-1:** To understand the concepts & advance topics related to two- & three-dimensional geometry.
- CO-2:** Geometry briefly is used in various daily life applications such as surveying, astronomy, navigation and building and much more.
- CO-3:** Compare the 2D and 3D objects and able to find angles, areas, plane equations, etc.
- CO-4:** Find family of spheres Passing through a circle, tangent planes and normal lines to a sphere.

ABSTRACT ALGEBRA

- CO-1:** Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers.
- CO-2:** Generate groups given specific conditions and knowledge of use various canonical types of groups
- CO-3:** Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups
- CO-4:** Develop the ability to form and evaluate conjectures

MATHEMATICAL REAL ANALYSIS

- CO-1:** Use the definitions of convergence as they apply to sequences, series, and functions
- CO-2:** Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration.
- CO-3:** Determine the continuity, differentiability, and integrability of functions defined on subsets of the real line
- CO-4:** Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and inerrability

LINEAR ALGEBRA

- CO-1:** Identify and construct linear transformations of a matrix.
- CO-2:** Compute and use Eigen vectors and Eigen values
- CO-3:** Determine the rank, determinant, Eigen values and eigenvectors, diagonalization, and different factorizations of a matrix
- CO-4:** Characterize linear transformations as onto, one-to-one

ANALYTICAL SKILLS (FOUNDATION COURSE)

- CO-1:** Making real-time decisions by rapidly assessing the facts and assumptions
- CO-2:** Identifying logical errors, false conclusions and unsubstantiated assertion
- CO-3:** Eliciting information from other using tactful and insightful questioning techniques
- CO-4:** Detecting and taking definitive action to prevent potential problems

NUMERICAL METHODS

- CO-1:** Understand the theoretical and practical aspects of the use of numerical analysis.
- CO-2:** The course will also develop an understanding of the elements of error analysis for numerical methods and certain proofs.
- CO-3:** Establish the limitations, advantages, and disadvantages of numerical analysis
- CO-4:** Analyze and evaluate the accuracy of common numerical methods

MATHEMATICAL SPECIAL FUNCTIONS

- CO-1:** Understand purpose and functions of the gamma and beta functions, Fourier series and Transformation
- CO-2:** Determine types of PDEs which may be solved by application of special functions.
- CO-3:** Analyze properties of special functions by their integral representations & symmetries.
- CO-4:** Evaluate different types of integral calculus problems and Fourier series to solve differential equations

MULTIPLE INTEGRALS AND APPLICATIONS OF VECTOR CALCULUS

- CO-1:** Learn multiple integrals as a natural extension of definite integral to a function of two variables in the case of double integral / three variables in the case of triple integral.
- CO-2:** Learn applications in terms of finding surface area by double integral and volume by triple integral.
- CO-3:** Determine the gradient, divergence and curl of a vector and vector identities.
- CO-4:** Evaluate line, surface and volume integrals.
- CO-5:** Understand relation between surface and volume integrals (Gauss divergence theorem), relation between line integral and volume integral (Green's theorem), relation between line and surface integral (Stokes theorem)

INTEGRAL TRANSFORMS WITH APPLICATIONS

- CO-1:** Evaluate Laplace transforms of certain functions, find Laplace transforms of derivatives and of integrals.
- CO-2:** Determine properties of Laplace transform which may be solved by application of special functions namely Dirac delta function, error function, Bessel function and periodic function.
- CO-3:** Understand properties of inverse Laplace transforms, find inverse Laplace transforms of derivatives and of integrals.
- CO-4:** Solve ordinary differential equations with constant/ variable coefficients by using Laplace transform method.
- CO-5:** Comprehend the properties of Fourier transforms and solve problems related to finite Fourier transforms.

PARTIAL DIFFERENTIAL EQUATIONS & FOURIER SERIES

- CO-1:** Classify partial differential equations, formation of partial differential equations and solve Cauchy's problem for first order equations.
- CO-2:** Solve Lagrange's equations by various methods, find integral Surface passing through a given curve and Surfaces orthogonal to a given system of Surfaces.
- CO-3:** Find solutions of nonlinear partial differential equations of order one by using Charpit's method.
- CO-4:** Find solutions of nonlinear partial differential equations of order one by using Jacobi's method.
- CO-5:** Understand Fourier series expansion of a function $f(x)$ and Parseval's theorem.

NUMBER THEORY

- CO-1:** Find quotients and remainders from integer division, study divisibility properties of integers and the distribution of primes.
- CO-2:** Understand Dirichlet multiplication which helps to clarify interrelationship between various arithmetical functions.
- CO-3:** Comprehend the behavior of some arithmetical functions for large n .
- CO-4:** Understand the concepts of congruencies, residue classes and complete residues systems.
- CO-5:** Comprehend the concept of quadratic residues mod p and quadratic non residues mod p .