

DEPARTMENT OF MATHEMATICS
S.D.Women's College, Rajgangpur
MATHS (B.Sc.)

1. PROGRAMME OUTCOMES (PO):-

PO1: Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.

PO2: Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.

PO3: Prepare students for pursuing research or careers in industry in mathematical sciences and allied fields

PO4: Imbibe effective scientific and/or technical communication in both oral and writing.

PO5: Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences.

2. PROGRAMME SPECIFIC OUTCOMES (PSO):-

PSO1: Demonstrate basic manipulative skills in algebra, geometry, trigonometry, and beginning calculus.

PSO2: Communicate mathematical ideas both orally and in writing

PSO3: Investigate and solve unfamiliar math problems

PSO4: Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.

PSO5: Prepare and motivate students for research studies in mathematics and related fields.

PSO6: Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.

PSO7: Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.

PSO8: Strong foundation on algebraic topology and representation theory which have strong links and application in theoretical physics, in particular string theory.

PSO9: Good understanding of number theory which can be used in modern online cryptographic technologies.

3. COURSE OUTCOMES (CO's):-

I-SEMESTER:

Core 1: CALCULUS: Hyperbolic function, Higher order derivative, Riemann Integration, Volume by splicing, triple product

Core 2: DISCRETE MATHEMATICS: Set relation function, Equivalence relations, Principle of Mathematical Induction, Matrices, Graph Theory.

II-SEMESTER:

Core 3: REAL ANALYSIS: Review of algebraic and order properties, sequence, limit, differentiability.

Core 4: DIFFERENTIAL EQUATIONS: Differential equation and mathematical Model, Compartmental model, Homogeneous equations, equilibrium point, battle model and its analysis.

III-SEMESTER:

Core 5: THEORY OF REAL FUNCTIONS: L' Hospitals rules, Taylors theorem, Riemann Integration improper integral, series of function.

Core 6: GROUP THEORY: Symmetric of a square, Group, Subgroup, Normal subgroup, factor group, Cauchy theorem, Homomorphism, Isomorphism.

Core 7: PARTIAL DIFFERENTIAL EQUATIONS AND SYSTEM OF ODEs: Basic concepts and geometrical interpretation, heat equation, wave equation, Laplace equation, Cauchy Problem, System of linear differential equations.

IV-SEMESTER:

Core 8: NUMERICAL METHODS AND SCIENTIFIC COMPUTING: Rate of convergence, Error, system of algebraic equation, interpolation, numerical integration.

Core 9: TOPOLOGY OF METRIC SPACES: Metric spaces, subspaces, continuity, contraction mapping and its application.

Core 10: RING THEORY: Ring, sub-rings, prime and maximal ideal, polynomial ring, divisibility of integral domain.

V-SEMESTER:

Core 11: MULTIVARIATE CALCULUS: Function of several variables, Limit and continuity, extreme function, triple integral, line integral.

Core 12: LINEAR ALGEBRA: Vector space, subspace, linear transformation, matrix representation, eigen space, orthogonal complement.

DSE – 1: LINEAR PROGRAMMING: Introduce to LPP, Simplex method, two phase method, Big M method, transportation problem, game theory.

DSE – 2: PROBABILITY AND STATISTICS: Sample space, events, Probability distribution, mathematical expectation, special probability distribution, sampling distribution.

VI-SEMESTER:

Core 13: COMPLEX ANALYSIS: complex numbers and complex plane, Cauchy theorem and its application, Morera's Theorem, Meromorphic function.

Core 14: GROUP THEORY – II: Automorphism, Commutator subgroup, Group action, Sylow's Theorem, Class equations.

DSE – 3: DIFFERENTIAL GEOMETRY: Theory of space curves, evolutes and involutes of curves, principle and Gaussian curvature, Geodesics, Canonical Geodesics equations.

DSE – 4: DISSERTATION/PROJECT

