

**GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE,
RAJNANDGAON (C.G.)**



DEPARTMENT OF MATHEMATICS

**PROGRAMME OUTCOMES AND COURSE OUTCOMES
2023-24**

Department of Mathematics
Course Outcome
B.Sc. I, II, III, IV Semester
Session 2023-24

B.Sc. I Semester:

Course Name (DSC): Calculus

On completion of the course, students will be able to

- (i) Draw curves in Cartesian and polar coordinate systems.
- (ii) Understand conceptual variations while advancing from one variable to several variables in calculus.
- (iii) Inter-relationship amongst the line integral, double and triple formulations.
- (iv) Realize importance of Green's, Gauss and Stoke's theorems in other branches of Mathematics.

B.Sc. I Semester:

Course Name (SEC): Probability and Statistics I

On completion of the course, students will be able to

- (i) Learn the concept of a random variable and the probability distributions.
- (ii) Able to express the concept of probability and its features.
- (iii) Calculate probabilities, and derive the marginal and conditional distributions.
- (iv) Able to use Poisson, exponential distributions to solve statistical problems.

B.Sc. II Semester:

Course Name (DSC): Differential Equations

On completion of the course, students will be able to

- (i) Understand the genesis of ordinary differential equations.
- (ii) Learn various techniques of getting exact solutions of certain solvable first order differential equations and linear differential equations of second order.
- (iii) Learn about solution of first order linear partial differential equations using Lagrange's method
- (iv) Formulate mathematical models in the form of ordinary differential equations to problems arising in physical disciplines.

B.Sc. II Semester:

Course Name (SEC): Probability and Statistics II (Project)

On completion of the course, students will be able to

- (i) Learn elementary theory of testing of hypothesis.
- (ii) Able to test of significance based on Chi-square distribution
- (iii) Able to test significance in sampling of attributes.
- (iv) Able to test of significance based on t, F and Z-distribution.

B.Sc. III Semester:

Course Name (DSC): Algebra and Mathematical Methods

On completion of the course, students will be able to

- (i) Understand the concept of equivalence relations
- (ii) Learn about the fundamental concepts of groups, subgroups, normal subgroups, isomorphism theorems, cyclic and permutation groups.
- (iii) Compute limit and continuity of function of two variables
- (iv) Apply the formula that determines stationary paths of a functional to deduce the differential equations for stationary paths

B.Sc. III Semester:

Course Name (DSE): Numerical Methods

On completion of the course, students will be able to

- (i) Obtain numerical solutions of algebraic and transcendental equations.
- (ii) Find numerical solutions of system of linear equations and check the accuracy of the solutions.
- (iii) Learn about various interpolating and extrapolating methods.
- (iv) Solve initial and boundary value problems in differential equations using numerical methods.

B.Sc. III Semester:

Course Name (SEC): Logic and Sets

On completion of the course, students will be able to

- (i) Implement Concepts of sets, subset, set operations and Venn diagram in real life.
- (ii) Able to solve practical problems on counting principal and power set of a set.
- (iii) Learn results of prepositions, truth table, negation, and conjunction and disjunction equivalence relation.
- (iv) Understand Logical equivalence, Predicates and quantifiers.

B.Sc. IV Semester:
Course Name (DSC): Real Analysis

On completion of the course, students will be able to

- (i) Learn the fundamental properties of the real numbers that underpin the formal development of real analysis
- (ii) Define and recognize bounded, convergent, divergent, Cauchy, and monotonic sequences.
- (iii) Apply the ratio, root test, and alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
- (iv) Understand the theory of sequences and series, continuity and differentiation.

B.Sc. IV Semester:
Course Name (DSE): Discrete Mathematics

On completion of the course, students will be able to

- (i) Learn about partially ordered sets, lattices and their types.
- (ii) Understand Boolean algebra and Boolean functions, logic gates, switching circuits and their applications.
- (iii) Solve real-life problems using finite-state machines.
- (iv) Learn about recurrence relation and recursive algorithms.

B.Sc. IV Semester:
Course Name (SEC): SCILAB (Project)

On completion of the course, students will be able to

- (i) Perform basic mathematical operations using Scilab software.
- (ii) Execute loops using Scilab software.
- (iii) Analyze different types of data using plotting functions in Scilab software.
- (iv) Develop skill to solve differential equations.



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Department of Mathematics
Course Outcome
B.Sc. Part III
Session 2023-24

On completion of the course, students will be able to

1. Understand the concept of vector space and inner product space.
2. Develop the knowledge of fundamental concepts of complex variables.
3. Understand improper integrals.
4. Understand the basic principle of Boolean algebra, set theory and logic.
5. Describe computer programs in formal Mathematical manner.
6. Develop the knowledge of numerical method for approximating the solution of problems of Mathematics.



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Department of Mathematics
Course Outcome
M.Sc. (Mathematics)
Session 2023-24

First Semester:

On completion of the course, students will be able to

- (1) Demonstrate knowledge and understanding of fundamental concepts of Algebra including groups, subgroups, normal subgroups, homomorphism and isomorphism.
- (2) Describe fundamental properties of the real numbers and real-valued functions.
- (3) Understand the concept of topological space.
- (4) Analyze sequence and series of analytic function and type of convergence.
- (5) Construct simple mathematical proof and possess the ability to verify them discrete mathematics.

Second Semester:

On completion of the course, students will be able to

- (1) Critically analyze and construct mathematical argument related to the study of abstract algebra.
- (2) Construct Mathematical proof of basic results in real analysis.
- (3) Understand the concept of product topological space.
- (4) Think critically by proving mathematical results and establishing theorems from complex analysis.
- (5) Model and solve real world problems using graphs.

Third Semester:

On completion of the course, students will be able to

- (1) Understand the fundamental of measure theory and be acquainted the proofs of the fundamental theorems of underlying the theory of integration.
- (2) Recognize the major classification of PDEs and the qualitative difference between the classes of equations.
- (3) Develop the knowledge of C Programming.
- (4) Create linear programming models for assignment and transportation problems.
- (5) Develop the knowledge of fuzzy sets, fuzzy operations and fuzzy graphs.

Fourth Semester:

On completion of the course, students will be able to

- (1) Explain fundamental concepts of functional analysis and their role in modern Mathematics
- (2) Propose the best strategy using decision making models under uncertainty and game theory.
- (3) Implement file operations in C Programming for a given application.
- (4) Develop mathematical skills to analyze and solve integer programming and network models arising from the a range of applications.
- (5) Develop the knowledge of application of fuzzy sets.



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Department of Mathematics

Programme Outcome

B.Sc. (Mathematics)

On completion of the programme, students will be able to

- PO1- Create, interpret and analyze graphical representation of functions and equations.
- PO2- Develop the knowledge of create Mathematical models to solve real-world problems.
- PO3- Understand the basic concepts, fundamental principles and Mathematical theories related to various mathematical phenomena and their relevance in day-to-day life.
- PO4- Develop the knowledge and understanding of axiomatic approaches in pure and applied Mathematics.
- PO5- Develop mathematical skill to solve problems.

M.Sc. (Mathematics)

On completion of the programme, students will be able to

- PO1- Solve problems in areas of mathematical science.
- PO2- Develop the skill of creativity and independence of thinking.
- PO3- Provide high quality of education in Mathematics within an environment of teaching.
- PO4- Apply knowledge of Mathematics to identify, analyze problems and to provide effective solutions in the area of Mathematics.
- PO5- Inculcate skills to excel in the fields of Mathematics and its enabled services (Government And Private sectors), Teaching and Research.
- PO6- To crack competition examinations, lectureship and fellowship examination



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Programme Specific Outcome

B.Sc. (Mathematics)

On completion of the programme, students will be able to

- PSO1- Student should be able to process recall basic idea about mathematics which can be displayed by them.
- PSO2- Student should have adequate exposure to many aspects of mathematical sciences.
- PSO3- Student is equipped with mathematical modeling ability, critical mathematical thinking and problem solving skill etc.
- PSO4- Student should be able to apply their skills and knowledge in various fields of studies including science, engineering, commerce and management.

M.Sc. (Mathematics)

On completion of the programme, students will be able to

- PSO1- Understand the basic concepts of advanced Mathematics.
- PSO2- Communicate effectively and to improve their competency skills to solve real world problem.
- PSO3- Develop the problem solving skill.
- PSO4- Solve critical problems by applying Mathematical tools.
- PSO5- Provide a systematic understanding of the concepts and theories of Mathematics.



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