

**PROGRAM: B. Sc. Mathematics**  
**B.Sc. Semester I (MATHEMATICS)**  
**DSC Paper 1: Elementary Mathematics**

**Course Outcomes (COs)**

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

CO1: Understand the concepts of number theory including divisibility, Euclidean algorithm, GCD, LCM, equivalence relations, and equivalence classes.

CO2: Analyse different types of matrices and apply matrix operations, rank, canonical forms, and Cayley–Hamilton theorem to solve systems of equations.

CO3: Solve polynomial equations using transformation techniques, Horner’s method, Descartes’ rule of signs, Cardano’s method, and Ferrari’s method.

CO4: Apply the concepts of complex numbers including De Moivre’s theorem, roots of unity, logarithm of complex variables, and separation into real and imaginary parts.

CO5: Develop analytical thinking and problem-solving skills in algebra, matrices, equations, and complex variable theory.

**GE/OE 1: Quantitative Aptitude**

**Course Outcomes (COs)**

After completion of this course, students will be able to:

1. Understand and apply the concepts of number system, H.C.F., L.C.M., decimal fractions, and simplification techniques.
2. Solve problems related to average, percentage, ratio, and proportion in daily life and competitive examinations.
3. Apply the concepts of profit and loss, simple interest, and compound interest in commercial and financial calculations.
4. Analyze and solve problems based on numbers, ages, surds, indices, and logarithms using mathematical reasoning.
5. Develop numerical aptitude, logical thinking, and problem-solving skills for academic and competitive purposes.

## **SEC 1: Equation Editor in MS Office**

### **Course Outcomes (COs)**

After completion of this course, students will be able to:

1. Technical Proficiency: Navigate the Microsoft Equation Editor to accurately insert and format a wide range of mathematical symbols and complex structures.
2. Advanced Notation Mastery: Construct professional-grade expressions for advanced topics including Calculus, Linear Algebra, Vector Calculus, and Piecewise functions.
3. Data Visualization: Integrate clear graphs, charts, and SmartArt to effectively represent mathematical data and relationships within a presentation.
4. Dynamic Content Creation: Design engaging educational materials using animations and interactive elements like hyperlinks and custom navigation.
5. Professional Delivery: Configure and manage advanced slide show settings to deliver polished, non-linear mathematical presentations.

## **B.Sc. Semester II (MATHEMATICS)**

### **DSC Paper 2: Differential & Integral Calculus**

### **Course Outcomes (COs)**

After completion of this course, students will be able to:

1. Apply successive differentiation, Leibnitz's theorem, Taylor's theorem, Maclaurin's theorem, and L'Hospital's rule to solve problems in single variable calculus.
2. Analyse functions of two variables using limits, continuity, partial derivatives, total differentials, homogeneous functions, and Jacobians.
3. Evaluate integrals using reduction formulae, Beta and Gamma functions, and understand their properties and interrelations.
4. Solve problems involving double and triple integrals, including change of order and change of variables.
5. Develop analytical and problem-solving skills in differential and integral calculus with applications in mathematics and related fields.

## **GE/OE 2: Aptitude & Reasoning**

### **Course Outcomes (COs)**

After completion of this course, students will be able to:

1. Solve quantitative aptitude problems related to time and work, time and distance, heights and distances, boats and streams, and trains.
2. Apply mathematical reasoning to solve problems on allegation, mixtures, and related numerical concepts.
3. Analyse and interpret logical reasoning problems involving Venn diagrams, analogies, and blood relations.
4. Solve problems based on directional sense, number series, letter series, and coding–decoding techniques.
5. Develop logical thinking, analytical ability, and problem-solving skills useful for competitive examinations and real-life applications.

## **SEC 2: Financial Mathematics**

### **Course Outcomes (COs)**

After completion of this course, students will be able to:

1. Calculate variables using both simple and compound interest;
2. Calculate variables using annuities formulas, including bond market value calculations;
3. Describe the features of promissory notes, bonds, and annuities;
4. Judge if a project is viable based on a Net Present Value calculation;
5. Demonstrate the interaction between interest rates and market prices for bonds;
6. Communicate using financial terminology;
7. Solve common business problems employing mathematics of finance.