

# RAYAT-BAHRA UNIVERSITY

Bridge course is designed to enhance their skills & ease out their transition in to engineering courses/ Physical Sciences; also to get them prepared for the competitive environment like GATE, Aptitude training & other competitions etc.

1. **Course Code: BDC 102**
2. **Course Name: Essential of Mathematics**
3. **Duration: 30 Hrs**

## **Unit-I (6 hrs)**

**Set Theory, Relations and Functions:** Definition and Representation, Types of Sets, Operation on Sets, Types of Relations, Partial order and Equivalence Relations, Types of functions, Composition and Inverse of functions

## **Unit-II (7 hrs)**

**Differential and Integral Calculus:** Single Variable Calculus, Definition and Representations, Limits and Continuity, Intermediate Value Theorem, Derivatives of a function, Differentiation rules, Integral Calculus, Applications of Integration, Definite and indefinite Integrals, Proper and improper integrals

## **Unit-III (7 hrs)**

**Matrices and Determinants:** Types of Matrices, Operations on Matrices, Determinants and Cofactors, Inverse of a Square Matrix, Rank of Matrix, Elementary row / column operations, System of Linear Equations, **Complex Numbers:** Concepts of modulus, Domain, Regions, Bounded sets, Complex functions, Limits of a complex function, Continuity of a complex function, Differential Equations

## **Unit-IV (5 hrs)**

**Analytical Geometry & Vector Algebra:** Polar Equation of Conics, Cartesian coordinate system, Relating Polar and Cartesian coordinates, Conic Section in Polar Coordinates

## **Unit-V (5 hrs)**

**Series & Sequences and Trigonometric Functions:** Generation of Angles, Useful Terminology, Quadrant, Quadrantile and Co-terminal angles, Measurement of angles: different systems, Cosine Formula, Sine Formula