FIRST YEAR
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Mathematics -I	E 101
Prerequisite :None	(2-2-1-0)

Functions: Functions and Their Graphs. Shifting and Scaling Graphs. Trigonometric Functions. Exponential Functions. Inverse Functions and Logarithms. Limits and Derivatives: Rates of Change and Tangents to Curves. Limit of a Function and Limit Laws. Precise Definition of a Limit. One-Sided Limits. Continuity. Limits Involving Infinity, Asymptotes of Graphs. Differentiation: Tangents and the Derivative at a Point. The Derivative as a Function. Rules for Polynomials, Exponentials, Products, and Quotients. The Derivative as a Rate of Change. Derivatives of Trigonometric Functions. The Chain Rule. Implicit Differentiation. Derivatives of Inverse Functions and Logarithms. Inverse Trigonometric Functions. Related Rates. Linearization and Differentials. Applications of Derivatives. Integration: Areas and Distances. The Definite Integral. Indefinite Integrals and the Net Change Theorem. The Substitution Rule. Areas between Curves. Volumes. Volumes by Cylindrical Shells. Work. Average Value of a Function. Techniques of Integration: by Parts. Trigonometric Integrals. Trigonometric Substitution. Integration of Rational Functions by Partial Fractions. Using Tables. Improper Integrals. Parametric Equations and Polar Coordinates: Curves Defined by Parametric Equations. Calculus with Parametric Curves. Polar Coordinates. Areas and Lengths in Polar Coordinates. Conic Sections. Conic Sections in Polar Coordinates. Complex Numbers: Definitions: real and imaginary parts. Complex arithmetic. Geometry of complex numbers. The polar-coordinate representation of complex numbers. Exponential notation and Euler's formula. The nth roots of a complex number.