VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
SYLLABUS FOR B.Sc. (MATHEMATICS) Multidisciplinary
Semester I
Elementary Calculus (MH-MLD-102)
Effective from June-2023
(Theory: 4 Hours/Week - Credit: 4)

Unit-I

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the reals with itself (upto $R \times R \times R$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, trigonometry. Sum, difference, product and quotients of functions.

Unit-II

Basic concept of a limit of a function, Rules of limits, Infinite limits and limits at infinity, Continuity and types of discontinuities, Differentiability of a function, differentiable functions.

Unit-III

Derivative of composite functions, Chain rule, Derivatives of trigonometric functions, Derivative of implicit function, Concepts of exponential, Logarithmic functions, Derivatives of $\log_e x$ and e^x.

Unit-IV

Integration as an inverse process of differentiation, Finite integral, integration of some functions by substitution, integration by partial fractions, integration by parts, Definite integrals.

The course is covered by the following reference books:

1. B. S. Grewal: Elementary Engineering Mathematics, S. Chand & Co.
2. Tom M. Apostol: Calculus, Volume I and II, Second edition, John Wiley & Sons Inc., New York.
3. Serge Lang: Basic Mathematics, Addison -Wesley Publishing Company, 1971.
4. Jain and Iyengar, Advanced Engineering Mathematics, Narosa Publishing House.