

**Gujarat Technological University**  
**BE- Sem - I**

**Mathematics-I**

- Review of limits, continuity, differentiability.
- Mean value theorem, Taylors Theorem, Maxima and Minima.
- Riemann integrals, Fundamental theorem of Calculus, Improper integrals, applications to area, volume.
- Convergence of sequences and series, power series.
- Partial Derivatives, gradient and directional derivatives, chain rule, maxima and minima, Lagrange multipliers.
- Double and Triple integration, Jacobians and change of variables formula.
- Parametrization of curves and surfaces, vector Fields, line and surface integrals.
- Divergence and curl, Theorems of Green, Gauss, and Stokes.

**Texts/References**

1. Hughes-Hallett et al., Calculus - Single and Multivariable (3rd Edition), John-Wiley and Sons (2003).
2. James Stewart, Calculus (5th Edition), Thomson (2003).
3. T. M. Apostol, Calculus, Volumes 1 and 2 (2nd Edition), Wiley Eastern 1980.
4. G. B. Thomas and R. L. Finney, Calculus and Analytic Geometry