

B.Sc. DEGREE PROGRAMME
MATHEMATICS (COMPLEMENTARY COURSE)
FIRST SEMESTER
MM1C01 : MATHEMATICS

4 hours/week

3 credits

30 weightage

Text : George B. Thomas Jr. and Ross L. Finney : Calculus, LPE, Ninth edition, Pearson Education.

Module I (24 hrs)

Limits and Continuity: Rules for finding limits. Target values and formal definitions of limits. Extensions of limit concept, Continuity, Tangent lines (Section 1.2, 1.3, 1.4, 1.5 & 1.6 of the Text).

Derivatives: The derivative of a function, a quick review of differentiation rules, rate of change. (Section 2.1, 2.2, 2.3 of the Text)

Module II (24 hrs)

Application of derivatives: Extreme values of a function. The mean value theorem, First derivative test, Graphing with y' and y'' . Limits as $x \rightarrow \pm \infty$. Asymptotes and Dominant terms, Linearization and differentials. (Section 3.1, 3.2, 3.3, 3.4, 3.5, 3.7 of the Text).

Module III (12 hrs)

Integration: Riemann sums and Definite integrals; properties, areas and the Mean value theorem. The Fundamental theorem. (Section 4.5, 4.6, 4.7 of the Text).

Module IV (12 hrs)

Application of Integrals : Areas between curves, Volumes of Solids of Revolution (Disk method only), Lengths of plane curves. Areas of surfaces of revolution (Section 5.1, 5.2, 5.3, 5.5, 5.6 of the text), The L'Hopital's Rule (See section 6.6 of the Text).

References

1. S.S. Sastry, Engineering Mathematics, Volume 1, 4th Edition PHI.
2. Muray R Spiegel, Advanced Calculus, Schaum's Outline series.