

B.Sc. DEGREE PROGRAMME
MATHEMATICS (CORE COURSE)
THIRD SEMESTER
MM3B03: CALCULUS

5 hours/week

4 credits

30 weightage

Text Book: Thomas / Finney : Calculus, 9th ed., LPE, Pearson Education.

Module I : (24 hrs)

- 3. Function quick review
- 4. Shifting graphs
- 1.1 Limit and continuity
- 1.2 The Sandwich theorem
- 1.3 Target values and formal definition of limits
- 1.4 Extensions of limit concept
- 1.5 Continuity
- 3.1 Extreme value of functions
- 3.2 The mean value theorem
- 3.3 The first derivative test for local extremum values

Module II (24 hrs)

- 3.4 Graphing with y' and y''
- 3.5 Limit as $x \rightarrow \pm \infty$
Asymptotes and dominant terms
- 3.6 Optimization
- 3.7 Linearization and differentials
- 4.5 Riemann sums and definite – integrals
- 4.6 Properties, area and the mean value theorem.

Module III (18 hrs)

- 4.7 The fundamental theorem
- 4.8 Substitution in definite integrals.
- 5.1 Areas between curves
- 5.2 Finding volumes by slicing
- 5.3 Volumes of solids of revolution (Disk method only)

Module IV (24 hrs)

- 5.5 Lengths of plane curves
- 5.6 Areas of surface of revolution
- 5.7 Moments and centres of mass
- 5.8 Work

References:

1. Anton : Calculus, Wiley.
2. S.K. Stein : Calculus with Analytic Geometry, McGraw Hill.

Seminar Topics

Clogging arteries, sensitivity, conversion of mass to energy

Cubic equation, biquadratic equations, Cardon's method, Ferraris method.

Fluid pressure and force

Basic pattern and other modelling applications