Coordinator: M.T. Nair July 7, 2014

MA-1010: Calculus - I: Functions of One Variable

Syllabus:

1. **Sequences and Series:**
   (a) Boundedness and convergence of sequences;
   (b) Tests of convergence of series;
   (c) Alternating series;
   (d) Absolute convergence.
2. **Differential Calculus:**
   (a) Limit, continuity, and differentiability of functions;
   (b) Properties of differentiable functions;
   (c) Rolle's theorem, mean value theorem and Taylor's formula;
   (d) Maxima, minima, points of inflection; Asymptotes and curvature.
3. **Integral Calculus:**
   (a) Definite integral as limit of a sum;
   (b) Properties of definite integrals;
   (c) Applications of definite integrals.
4. **Series of functions:**
   (a) Sequence and series of functions;
   (b) Power series and
   (c) Fourier series.

References

1. Thomas, G.B. and Finney, R.L., *Calculus and Analytical Geometry*, Addison Wesly, 1998.
2. Ghorpade, S.R. and Limaye B.V., *A course in Calculus and Real Analysis*, Springer 2007.