

MA 1010 Calculus

Calculus of one variable:

Sequence of real numbers: convergence of sequences.

Series of real numbers: convergence of series, tests for convergence, alternating series, absolute and conditional convergence.

Differential calculus: Review of limit, continuity and differentiability of functions, Leibniz rule for higher order derivatives, Rolle's theorem, Mean value theorem, Taylor's formula, maxima, minima, points of inflection, asymptotes and curvature

Integral Calculus: Riemann integral, fundamental theorem of calculus, improper integrals, applications of integrals to area and volume.

Power Series, Taylor series and Fourier series.

Differential Calculus of several variables:

Geometric representation, limits, continuity, partial derivative and differentiability, derivatives of composite functions, directional derivatives, gradient, divergence, curl, Taylor's formula, maxima and minima and Lagrange multipliers.

Texts:

1. Thomas G.B., Jr. and Finney, R.L., Calculus and Analytic Geometry, Addison Wesley, 1998, ISBN-13:978-0201531749.
2. Ghorpade, S.R., Limaye, B.V., A Course in Calculus and Real Analysis, Springer, 2007, ISBN: 978-81-8128-485-3.

Reference:

1. E. Kreyszig, Advanced engineering mathematics, 10th Edition, John Wiley & sons (2011), ISBN:978-81-265-5423-2.
2. T. M. Apostol, Calculus-Volume 1 and 2 (2nd Edition), Wiley Eastern 1980, ISBN-13: 978-0471000051 and ISBN-13: 978-0471000075.