Mathematics I - Video course

NP-TEL

NPTEL

http://nptel.ac.in

Basic courses(Sem 1 and 2)

1. Calculus of Functions of One Variable
Real Numbers, Functions, Sequences, Limit and Continuity, Differentiation : review, successive differentiation, chain rule and Libnitz theorem, Rolle's and Mean Value Theorems, Maxima/ Minima, Curve Sketching, Linear and Quadratic Approximations, Error Estimates, Taylor's Theorem, Newton and Picard Methods, The Riemann Integral, Approximate Integration, Natural Logarithm, Exponential Function, Relative Growth Rates, L'Hospital's Rule Geometric Applications of Integrals, Infinite Series, Tests of Convergence, Absolute and Conditional Convergence, Taylor and Maclaurin Series

2. Calculus of Functions of Several Variables
Scaler fields, Limit and Continuity, Partial derivatives, Chain rules, Implicit differentiation, web Gradient, Directional derivatives, Total differential, Tangent planes and normals, Maxima, Minima and Saddle Points, Constrained maxima and minima, Double Integrals, Applilcations to Areas and Volumes, Change of variables

3. Vector Calculus
Vector fields, divergence and curl, Line Integrals, Green's Theorem, Surface integrals, Divergence Theorem, Stoke's theorem and application

Coordinators:

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