

SYLLABUS

APPLIED CALCULUS

Module: 1. Differential Calculus

Functions, graph of functions, New functions from Old functions, Limit of a function, Continuity, Limits at infinity, Derivative as a function, Maxima and Minima of functions of single variable, Mean value theorem, Effect of derivatives on the shape of a graph.

Activities: Visualization of the functions, Maxima and Minima of a function using open source software, Solving of Competitive Examination questions (Ex. GATE).

Module: 2. Functions of several variables

Partial derivatives, Chain rule, Total derivative, Maxima and minima of functions of two variables, Method of Lagrange's Multipliers, Application problems in engineering.

Activities: Partial Derivatives with two or three variables, Maxima and Minima of a function using-source software, Solving of Competitive Examination questions (Ex. GATE).

Module: 3. Integral Calculus

Fundamental theorem of Calculus, Indefinite integrals and the Net Change Theorem, Improper integrals, Arc Length, Area of Region, Area of surface of revolution.

Activities: Definite and Indefinite Integrals, Determination of Area, Solving of Competitive Examinations (Ex. GATE).

Module: 4. Multiple Integrals

Iterated integrals and Fubini's theorem, Evaluation of double integrals, change of order of integration, change of variables between Cartesian and polar co-ordinates, evaluation of triple integrals-change of variables between Cartesian and cylindrical and spherical co-ordinates.

Activities: Double integrals and triple integrals using open-source software, solving of Competitive Examination questions (Ex. GATE).

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