NOC:Differential Calculus in Several Variables - Video course

COURSE OUTLINE

This is part of a standard course contents in Several Variable Calculus. The idea of the course is to provide students with different backgrounds a common platform to take up further topics in Mathematics, Physics and Engineering.

COURSE DETAIL

Week. No.	Topics
1	Functions of several variables and examples; continuity; concept of distances in higher dimension; examples; how to define differentiable functions.
2	Directional derivatives as direct generalization from one variable; drawbacks; definition of differentiable functions of several variable; examples; matrix of a linear transformation; Jacobian matrix; recovering directional derivative from derivative; chain rule.
3	Comparison with one variable calculus: version of MVT, higher derivatives and Taylor's formula; Sufficient condition for equality of mixed derivatives; extremas for real valued function and special case for functions with two variables.
4	Statement of Implicit Function Theorem and Inverse Function Theorem.; deriving Inverse Function Theorem form Implicit Function Theorem; Illustration of Implicit Function Theorem for function of two variables; examples from solutions of ordinary differential equations; proof of Implicit Function Theorem; Lagrange's Multipliers.

NP-TEL

NPTEL

http://nptel.ac.in

Mathematics

Pre-requisites:

A course in one variable calculus

Additional Reading:

1. Principles of Mathematical Analysis, W. Rudin
2. Calculus ¸ T. Apostol
3. Mathematical Analysis, T. Apostol

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