



CALCULUS OF SEVERAL REAL VARIABLES

PROF. JOYDEEP DUTTA

Department of Economic Sciences
IIT Kanpur

PRE-REQUISITES : Calculus of One Real Variable

INTENDED AUDIENCE : Any Interested Learners

COURSE OUTLINE :

This course introduces Calculus of several real variables, which has important applications in science and engineering. The modern world would have been impossible without it. We introduce and discuss the subject in a non-traditional way taking the vector approach in most places. We start with the basics of Vectors, study continuity and partial derivatives, multiple integrals and their applications and end with the Stokes Theorem and Gauss divergence theorem.

ABOUT INSTRUCTOR :

Prof. Joydeep Dutta is currently a Professor of Economics at the Department of Humanities and Social Sciences, IIT Kanpur. He was previously a Professor at the Department of Mathematics and Statistics at IIT Kanpur. His research interest primarily lies in optimization though he loves mathematics as a whole.

COURSE PLAN :

Week 1: Vectors and Matrices

Week 2: Functions of several variables and partial derivatives

Week 3: IFT, Taylor's Theorem, Maxima and Minima

Week 4: Lagrange Multiplier Rule

Week 5: Multiple Integrals

Week 6: Line Integrals

Week 7: Surface Integrals

Week 8: Green's Theorem, Stokes Theorem and Gauss Divergence Theorem