1.	Title of the course	Multivariable Calculus and Measure Theory
2.	Course number	MA510L
3.	Structure of credits	3-1-0-4
4.	Offered to	PG
5.	New course/modification to	Modification To MA5202/10
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the calculus of real-valued functions of several real variables, Lebesgue measure theory and then the properties of Lebesgue p-integrable functions.	
10.	**Course Content:** Functions of several variables, open sets in Euclidean spaces, limits, continuity, differentiation of functions of several variables; Inverse function theorem; Implicit function theorem; Review of Riemann-Stieltjes integral; Lebesgue measure, Lebesgue outer measure, Lebesgue measurable sets, measure on an arbitrary sigma-algebra; Measurable functions, integral of a simple measurable function, integral of positive measurable functions; Lebesgue's monotone convergence theorem; Lebesgue integrability; Dominated convergence theorem; Lp-spaces; Differentiation and fundamental theorem for Lebesgue integration; Product measure; Statement of Fubini's theorem.	
11.	**Textbook(s):** 1. Royden H L, *Real Analysis*, Prentice Hall of India (1995). 2. Rudin W, *Real and Complex Analysis*, McGraw-Hill, International Editions (1987).	
12.	**Reference(s):** 1. Barra G D, *Measure and Integration*, Wiley Eastern Ltd (1981). 2. Edwards H M, *Advanced Calculus: A Differential Forms Approach*, Birkhauser (1994). 3. Folland G B, *Advanced Calculus*, Pearson (2012). 4. Rana I K, *An Introduction to Measure and Integration*, Narosa Publishing Agencies (1997).	