1.	Title of the course	Measure Theory
2.	Course number	MA520L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	New
5.	To be offered by	Mathematics and Statistics
6.	Prerequisite	CoT
7.	**Course Objective(s):** To review the notion of a length of an interval. To discuss the measure of a set and measurable sets. To develop the theory of Lebesgue integration and then Lebesgue p-integrable functions.	
8.	**Course Content:** Semi-algebra, algebra, monotone class, sigma-algebra, monotone class theorem; Outer measure induced by the length, the Caratheodory condition, Lebesgue measurable sets in $\mathbb{R}$, non-measurable sets in $\mathbb{R}$; Measurable functions, simple functions, Egoroff's theorem, Lebesgue integral and its properties, monotone convergence theorem, Fatou's Lemma, dominated convergence theorem, various modes of convergence and their relations; Introduction to Lp spaces, Riesz-Fischer theorem, Riesz representation theorem for L2 spaces; Absolute continuity of measures, Radon-Nikodym theorem; Dual of Lp spaces; Product measures, iterated integrals and Fubini's theorem.	
9.	**Textbook(s):** 1. Royden H L and Fitzpatrick P M, Real Analysis, 4th Edition, Prentice Hall of India (2015). 2. Rudin W, Real and Complex Analysis, 3rd Edition, McGraw-Hill (2017).	
10.	**Reference(s):** 1. Halmos P R, Measure Theory, Graduate Text in Mathematics, 1st Edition, Springer Verlag (1979). 2. Barra G D, Measure and Integration, 3rd Edition, Wiley Eastern Ltd. (1981). 3. Rana I K, An Introduction to Measure and Integration, 2nd Edition, Narosa Publishing Agencies (1997). 4. Billingsley P, Probability and Measure, 3rd Edition, Wiley India Pvt. Ltd. (2008).	