This is a course on the concepts of Measure and Integration. Normally, this is a core course for M.,Sc. Mathematics and Statistics students. The concepts find applications in advance Analysis Courses, Signal Processing, Financial Mathematics courses.

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**COURSE OUTLINE:**

Week 01: Introduction, Extended Real Numbers, Algebra and Sigma Algebra of Subsets of a Set, Lecture 3B Sigma Algebra generated by a Class.

Week 02: Monotone Class, Set Functions, The Length Function and its Properties.

Week 03: Countably Additive Set Functions on Intervals, Uniqueness Problem for Measure.

Week 04: Extension of Measure, Outer Measure and its Properties, A Measurable Sets.

Week 05: Lebesgue Measure and its Properties, Characterization of Lebesgue Measurable Sets.

Week 06: Measurable Functions, Properties of Measurable Functions, Measurable Functions on Measure Spaces.

Week 07: Integral of Nonnegative Simple Measurable Functions, Properties of Nonnegative Simple Measurable Functions, Monotone Convergence Theorem and Fatou's Lemma.

Week 08: Properties of Integrable Functions and Dominated Convergence Theorem, Dominated Convergence Theorem and Applications.


Week 10: Computation of Product Measure.

Week 11: Integration on Product Spaces, Fubini's Theorems

Week 12: Lebesgue Measure and Integral on R^2, Properties of Lebesgue Measure on R^2, Lebesgue Integral on R^2.