

MT502: REAL ANALYSIS

Syllabus: Algebra and algebra of sets; algebras generated by a class subsets; Borel Sets; Lebesgue measure of sets of real numbers, Measurability and measure of a set; Existence of Non-measurable sets; Measurable functions; Realization of non negative measurable function as limit of an increasing sequence of simple function; Structure of measurable functions; Convergence in measure; Egoroff's theorem; Weierstrass's theorem on the approximation of continuous function by polynomials; Lebesgue integral of bounded measurable functions; Lebesgue theorem on the passage to the limit under the integral sign for bounded measurable functions; Summable functions; Space of square summable functions; Fourier series and coefficient,Parseval's identity; Riesz-Fisher Theorem; L^p - spaces, Holder-Minkowski inequalities; completeness of L^p - spaces

UNIT SCHEDULE

- Unit 1** Algebra and algebra of sets
- Unit 2** Lebesgue measure and measurable set
- Unit 3** Measurable functions and Convergence of sequence of Measurable functions
- Unit 4** Weierstrass's approximation theorem and Lebesgue integral
- Unit 5** Summable functions, Space of square summable functions
- Unit 6** Fourier series and coefficient, Parseval's identity, Riesz-Fisher Theorem
- Unit 7** L^p - spaces, Holder-Minkowski inequalities; completeness of L^p - spaces