ICTP DIPLOMA PROGRAMME IN MATHEMATICS 2016-17

Real Analysis

F. Maggi (15 lectures : 22.5 hrs)

Measures. Countable additivity and the problem of non-measurable sets. The Charateodory construction. Hausdorff measures and basic properties. Measurable functions, approximation by piecewise constant functions and integration. Egoroff theorem. Monotone convergence, dominated convergence, Fatou lemma. Product measures and Fubini theorem. Lp spaces, pointwise vs integral convergence. Riesz-Fisher theorem and convergence of approximation schemes. Convolutions, Lusin's theorem, and density theorems. Weak convergence of Radon measures.