

Analysis Syllabus

Essentially the syllabus is the first 16 Chapters of Rudin's Real and Complex analysis text;

Topics from advanced Calculus: Continuity and limits, derivatives, Riemann integral. Taylor series and Taylor polynomial. Uniform convergence and its consequences. Inverse Function theorem. Implicit function theorem. Gradients and Jacobian. Green's theorem and Stokes theorem.

Measure Theory and Integration: Lebesgues measure. Metric spaces and Topology of R^n . Properties of measures. Lebesgues integral. Fatou's Lemma and convergence theorems. Riesz representation Theorem. Hilbert spaces. Norms. Banach spaces. L_p spaces. Holders Inequality. Fubini's Theorem. Radon-Nykodym derivatives.

Complex Analysis: Analytic and Meromorphic functions. Power series. Cauchy integral theorems. Fourier transforms and Fourier series Parsaval's identity. Analytic continuation. Maximum modulus principle. Rouche's Theorem Open mapping theorem. Conformal mappings. Weierstrass approximation. Fundamental theorem of Algebra. Representation of analytic functions in terms of their zeros. Poles and essential singularities. Picard's theorems.