ANALYSIS SYLLABUS

Metric Space Topology

Metrics on R^n, compactness, Heine-Borel Theorem, Bolzano-Weierstrass Theorem.

Sequences and Series

Limits and convergence criteria.

Functions defined on R^n

Continuity, uniform continuity, uniform convergence, Weierstrass Comparison Test, uniform convergence and limits of integrals, Ascoli's Theorem.

Differentiability

Differentiable functions, chain rule, local maxima and minima.

Transformations on R^n

Derivative as a linear transformation, inverse function theorem, implicit function theorem.

Riemann integration on R^n

Riemann-integrable functions, improper integrals; line integrals, surface integrals; change of variable formula; Green's theorem, Stokes' theorem, Gauss' divergence theorem.

References

Bartle, R. G, and Sherbert, D. R., *Introduction to Real Analysis.* John Wiley & Sons (1992)

R. Creighton Buck, *Advanced Calculus.* McGraw-Hill (1978)

Walter Rudin, *Principles of Mathematical Analysis.* McGraw-Hill (1976)

Strichartz, R. S., *The Way of Analysis.* Jones and Bartlett (1995)