Although the exam is not restricted to the listed topics, students will be responsible for the following material for the written exam in Analysis. Topics marked "A" are material where a knowledge of proofs and substantial understanding of the subject is expected. Those marked "B" are topics where somewhat less familiarity is required.

REAL VARIABLES. A. Structure of Real number system; Heine-Borel Theorem; Bolzano Weierstrass; Limits, continuity, convergence; Differentiation; Riemann Integral; Sequences and Series; Commutativity of operations; Cardinality of various subsets of reals; Implicit Function theorem.

B. Weierstrass Approximation Theorem; Fourier Series; Vitali Covering Theorem (1 dimension); Cantor type Sets and Functions; Bounded Variation and Absolute Continuity.

MEASURE THEORY. A. Measure on Reals (Classical); Borel Sets and Measureable Sets; Lebesgue Integral; Convergence Theorems.

B. Egoroff's Theorem.

COMPLEX VARIABLES. A. Complex Number System; Analytic Functions; Cauchy Theorems and Implications; Elementary Functions; Identity Theorem, Morera's Theorem, Liouville's Theorem, Rouche's Theorem; Laurent Series and Residue Integration; Singularities.

B. Picard's Theorem.

TOPOLOGY. A. Topological Space; Metric Spaces; Metrization Theorem; Definitions: Closure, Boundary or Frontier, Interior, Connected, Component, Locally Connected, Compact, Normality, Regularity, Separable, Hausdorff or Separated Space; Complete; One point compactification Theorem; Product Spaces, Mappings.

B. Peano Curve; Jordan Curve Theorem; Uniform Spaces; Osgood Curve; Zorn's Lemma; Axiom of Choice.

It is expected that the exam will be divided into two parts:

4 hours for real and complex variables and measures
2 hours for Topology.