Modified Analysis Comps Syllabus:

This examination involves topics mainly from MATH 4650, and MATH 5800.

Specifically, students are expected to know the following basics from MATH 4650 (only R):

- 1. Sequences of real numbers, limits, convergence (using epsilon-N proofs)
- 2. Series of real numbers, limit as a sequential limit of partial sums, tests for convergence of series
- 3. Bounded sequences, Cauchy sequences, Cauchy convergence criterion
- 4. Cluster points, liminf and limsup of a sequence
- 5. Topology: open, closed, connected sets, including definitions and examples (closure, boundary, interior of a set)
- 6. Compact sets, including definitions and examples
- 7. Bolzano-Weierstrass Theorem
- 8. Heine-Borel Theorem
- 9. Limits and continuity of functions from R to R

References:

- 1. Elementary Classical Analysis, J. Marsden and M. Hoffman
- 2. Introduction to Real Analysis, R. Bartle and D. Sherbert
- 3. Elements of Real Analysis, H. Gaskill and P. Narayanaswaml
- 4. Introduction to Real Analysis, Vol 1, J. Lebl

Also, students are expected to know the following basics from MATH 5800:

- 1. Riemann Integration, Fundamental Theorem of Calculus
- 2. Sigma Algebras
- 3. Measures
- 4. Measure Spaces and Measurable Functions
- 5. Lebesgue Integral of Simple and Continuous Functions
- 6. Convergence Theorems: Monotone Convergence Theorem and Dominated Convergence Theorem
- 7. Lebesgue Measure on R
- 8. L^p Spaces