Topics for the Ph.D. Preliminary Examination

ANALYSIS

Fundamentals of Analysis (MAT 601-602)

The basic material is contained in Rudin's "Principles of Mathematical Analysis" 3rd Edition, Chapters 1 through 9. Important topics are:

1. Properties of real and complex numbers.
2. Elementary topology of metric spaces: compactness, completeness, etc.
3. Numerical sequences and series.
4. Functions: continuity, differentiation, Riemann-Stieltjes integration.
5. Functions: sequences and series (uniform convergence and applications, equicontinuous families, Stone-Weierstrass Theorems, power series).
6. Calculus of several variables: differentiation, Inverse and Implicit Function Theorems.

References

1. Rudin (listed above).
2. W. Flemming, "Functions of Several Variables".