UNIVERSITY OF PUERTO RICO
RIO PIEDRAS CAMPUS
DEPARTMENT OF MATHEMATICS

ANALYSIS
M.S. QUALIFYING EXAM
SYLLABUS

It is expected that students know the theoretical concepts (definitions and theorems) and can solve typical problems and exercises covering the following topics:

1. ELEMENTS OF LOGIC AND SET THEORY. THE REAL NUMBER SYSTEM. THE TOPOLOGY OF R. METRIC SPACES.

2. SEQUENCES AND SERIES. LIMITS AND CONTINUITY. UNIFORM CONTINUITY.

3. DIFFERENTIATION. RIEMANN INTEGRATION.

4. SEQUENCES AND SERIES OF FUNCTIONS. UNIFORM CONVERGENCE.

5. LEBESGUE MEASURE AND INTEGRATION ON THE REAL LINE. MONOTONE CONVERGENCE THEOREM, FATOU'S LEMMA, LEBESGUE'S DOMINATED CONVERGENCE THEOREM, THE RIESZ-FISCHER THEOREM.

References

1. Rudin, Walter, *Principles of Mathematical Analysis, 3rd edition*, McGraw-Hill, 1976.

2. Royden, H.L., *Real Analysis, 3rd edition*, Macmillan, 1988.

3. Rudin, Walter, *Real and Complex Analysis, 3rd edition*, McGraw-Hill, 1987.

4. Wade, William R., *An Introduction to Analysis, 3rd edition*, Prentice Hall, 2000.