MAA 5229/4227 - MODERN ANALYSIS 2
SYLLABUS

INSTRUCTOR: Paul Robinson
CLASS TIME: MWF period 4 (10:40-11:30)
CLASSROOM: 219 Little Hall

TEXT: Walter Rudin, *Principles of Mathematical Analysis* (third edition)

This second-semester course has the same foundational goals as the first, but it addresses a different set of topics. In principle, it will cover material from chapters six, seven, eight, and eleven of Rudin, as indicated in the official syllabus.

In chapter six we shall focus primarily on the simpler Riemann integral, incorporating modifications that are attributable to Darboux; the Riemann-Stieltjes integral is largely superseded by the material of chapter eleven.

Our study of chapters seven and eight will be rooted in the notion of uniform convergence for sequences of functions, with excursions into approximation theory (via the Weierstrass approximation theorem and its generalizations) and differential equations (via the Arzela-Ascoli theorem on equicontinuous families of functions). Taken together, these topics are likely to take us a little way past midterm.

The remainder of the semester is devoted to chapter eleven, on the Lebesgue integral; this is perhaps the most demanding part of the course, coverage of which is fully deserving of half a semester

Homework problems will be assigned and discussed in class. Some of these problems will be officially posted to Canvas, collected and graded, with comments. There will also be an optional midterm (approximately half way through the semester) and an optional final: each of these will serve as practice for the Analysis First-Year Examination. Assignment of grades will be determined by performance in the official homework assignments.

The Canvas page for this course will again be just that: a page. It will serve as a repository for course materials: homework problems to be submitted for grading, practice midterm and practice final, and whatever additional items seem appropriate.