January 15, 2014

# MATH 191 - SPRING 2014
# MEASURE AND CATEGORY

**Time:** MWF 1:00 in MS 5147

**Office hours:** J. Garnett MWF 1:30 in MS 7941, jbg@math.ucla.edu

**Texts:** 1. Marianna Csörnyei, Measure and Category,

(http://www.homepages.ucl.ac.uk/ ucahmcs/teaching/mc.pdf) (required, but free)

2. John C. Oxtoby, Measure and Category, Second Edition, Springer-Verlag, New York, ISBN 0-387-90508-1 (recommended)

**Material:** This course will cover some basic theorems from metric space topology, measure theory, and set theory and the relations between these three subjects. We will prove several theorems that compare and contrast the Baire Category Theorem with results from Measure Theory such as Fubini's Theorem and the Poincaré Recurrence Theorem. Further topics will include the Banach-Mazur game, transfinite induction, the Borel Hierarchy, and Martin's Borel Determinacy Theorem.

**Prerequisites:** 131AB or the instructor's permission, and the ability to write a correct proof. This course intersects courses 121, 131C, 245A, and 114L, and it can be taken before, after, or concurrently with any of them. Advanced undergraduates or graduate students in pure or applied mathematics are welcome.

**Grade:** Grades will be on homework, possible in-class presentations, and a take-home final exam.

John Garnett