Real Variables I: Math 607  
Fall 2011, TR 3:55–5:10 in Blocker 164

Professor: Michael Anshelevich, Milner 326, manshel@math.tamu.edu.
Webpage: www.math.tamu.edu/~manshel/m607/m607.html.
Office hours: M 2–3 p.m., TR 2:20–3:20 p.m., or by appointment.

Prerequisites: Math 447 or equivalent. Particularly, Lebesgue integration on the real line (rather than on abstract measure spaces), and analysis on metric spaces (rather than on topological spaces).

Learning Objectives: This course, together with Math 608, covers the fundamental theorems and examples of graduate Real Analysis: measure theory, analysis on topological spaces, and (in Math 608) basic results from Functional Analysis, and the study of $L^p$ spaces. These are the topics whose knowledge is tested on the Real Analysis qualifying exam. The course also provides the background for further study and research in various fields of Mathematical Analysis, including Functional and Harmonic Analysis, Banach spaces, Operator Algebras and Operator Theory, and Probability theory.

Brief course outline:

- Abstract measure theory (weeks 1–3).
  - $\sigma$-algebras. Measures. Outer measures and Caratheodory’s construction.
- Integration of measurable functions (weeks 3–7).
- Signed and complex measures (weeks 8-10).
- Point set topology (weeks 11-15).

See also the Real Analysis Qualifying Exam syllabus.

Exams: We will have two two-hour tests. The midterm exam will be around the middle of the term, time and date to be arranged in class. The final exam will be on Tuesday, December 13, 8–10 a.m. If, under completely exceptional circumstances, you need to miss one of the tests, a make-up exam will be given. Only University-approved excuses will be accepted, and you have to let me know preferably in advance, and no later than 2 days after the exam. The exams are closed book and closed notes.
**Homework:** Weekly, due on Tuesdays in class. Part of each assignment will be designated a “quiz” and graded by me; selected problems from the remainder will be graded by the grader. You are encouraged to work on the homework together, but straight copying is not allowed. Late homework will not be accepted, but the lowest assignment score in each category will be dropped.

In addition, each week at least one student will type or write up the official version of the homework solutions, which (after being checked by me) will be posted on the web site.

**Grading:** Each test 30%, homework 15%, quizzes 15%, homework write-up 10%. A total score of 90% or more guarantees an A, a score of 80% or more a B, 70% or more a C, 60% or more a D.

**Scholastic Dishonesty:** Cheating of any form is not acceptable and it will be dealt with harshly. In particular, copying work done by others, either in-class or out of class, is an act of scholastic dishonesty and it will be prosecuted to the full extent allowed by university policy. Collaboration on assignments is permitted for this course, however each student must write up their own solutions. For more information on university policies regarding scholastic dishonesty, see the University Student Rules.

**Aggie Honor Code:** “An Aggie does not lie, cheat, or steal or tolerate those who do.”

**Students with disabilities:** Come talk to me no later than the first week of classes. “The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe that you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845–1637.”

**Attendance:** According to the University Student Rules, absence for three or more class days requires a University-approved excuse and documentation.

**Other important dates:** September 2 (last day to add or drop a course), November 4 (Q-drop), November 24–25 (Thanksgiving), December 6 (last day of classes).

**Weekly schedule:** (approximate, subject to adjustment)

- Week 1: 1.1, 1.2, 1.3
- Week 2: 1.4, 1.5
- Week 3: 1.5, 2.1
- Week 4: 2.2, 2.3
- Week 5: 2.3, 2.4
- Week 6: 2.5
- Week 7: 2.6, 2.7
- Week 8: 3.1, 3.2
- Week 9: 3.3, 3.4
- Week 10: 3.5
- Week 11: 4.1
- Week 12: 4.2, 4.3
- Week 13: 4.4, 4.5, Th.
- Week 14: 4.5, 4.6, 4.7
- Week 15: 4.7, 4.8

**Keys to success:** Attend class (of course :) Solve all the homework problems, well before the exams. Spend more than seven hours per week working on the problems. Form study groups to discuss the course material and homework problems. Read ahead in the text.

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