

# MAT 701 Real Variables I

Fall 2014

TuTh 2:00pm - 3:20am, 111 Carnegie Hall

**Instructor:** Jani Onninen

Office: 304A Carnegie

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Office hours: Tu 11:00-12:00 and Wed 11:30-12:30, and by appointment.

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**Textbook:** R.L. Wheeden, A. Zygmund, *Measure and Integral. An introduction to real analysis.*, Taylor & Francis, New York, 1977.

## Some Other References:

G.B. Folland, *Real Analysis Modern Techniques and Their Applications*, John Wiley, New York, 1999.

W. Rudin, *Real and Complex Analysis*, McGraw-Hill, New York, 1987.

**Course Content:** This course is an introduction to graduate real analysis. We will cover Chapters 3–8 in the text. Also, parts of 10, parts of 11 if time permits. Topics include: measures,  $\sigma$ -algebras, outer measures, Borel measures, measurable functions, integration, modes of convergence, Fubini-Tonelli theorem, decomposition and differentiation of measures, signed measures, Lebesgue-Radon-Nikodym theorem, Banach Spaces,  $L^p$  spaces.

**Grading:** The course grade will be based on a midterm exam (30%) in the last half of October, a final exam (40%) on Wednesday, December 10, 5:15pm–7:15pm and homework problems (30%).

There will be no make-ups for these exams. A missed examination counts as a zero unless you present a valid excuse from a physician or the Dean's office. All exams are closed books and closed notes. The final exam is comprehensive. The exams will consist of solving problems and of theoretical questions on the material. (i.e. definitions of important concepts, relevant examples, statements and proofs of theorems)

## Homework:

*I hear, and I forget;*

*I see, and I remember;*

*I do, and I understand.*

*-Proverb*

The key to success in this course is to master the homework. Homework will be collected weekly, usually on Thursdays. No late homework will be accepted. You are encouraged to discuss the homework problems with your classmates and to work together, but submitted assignments must be written up individually.

**Note:** You are expected to attend every class. If you must miss a class for some reason, it will be up to you to find out from me or other members of the class what you missed including any announcements concerning

homework, or exams that were made during the class. You are highly encouraged to ask questions in class.

**Academic Integrity** The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>

**Religious Observances Policy:** Syracuse University's religious observances policy, found at [http://supolicies.syr.edu/emp\\_ben/religious\\_observance.htm](http://supolicies.syr.edu/emp_ben/religious_observance.htm), recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice/Student Services/Enrollment/My Religious Observances from the first day of class until the end of the second week of class.

**Students with Disabilities:** Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to the instructor and review those accommodations with the instructor. Accommodations, such as exam administration, are not provided retroactively; therefore, planning for accommodations as early as possible is necessary.

**Tips for success in this course:**

- 1) It is absolutely essential that you understand how to solve all the assigned problems. Once you understand how to solve a problem, write your solution down neatly and in full detail with explanations that make your reasoning clear.
- 2) Don't fall behind! If you are having difficulty, see me immediately to discuss the problem!
- 3) Take advantage of office hours.
- 4) Discussing problems with a classmate is very useful.
- 5) Again, questions in class are strongly encouraged.
- 6) I believe you can be successful in this course! You should expect to work hard. Don't get discouraged if you find some of the material difficult. Be persistent and patient! If you follow the above suggestions, your experience in this course will be a rewarding one.

*I look forward to a great semester!*