MATH 6100 - THEORY OF FUNCTIONS OF A REAL VARIABLE - FALL 2023

Instructor: Jesse Peterson
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Office: SC 1414
Office Hours:
   Tuesdays 8:30 - 9:40pm
   Thursdays 2:30 - 4:00pm
   Or by appointment

Prerequisites: Math 3100: Introduction to Analysis for Undergraduates.

Website: The course website will include useful information, including the daily schedule and homework assignments. The website address is:

  `http://www.math.vanderbilt.edu/peters10/teaching/fall2023/math6100.html`

Required textbook :
   Measure, Integration & Real Analysis, by Sheldon Axler
   ISBN: 9783030331429
   A freely available pdf copy of the textbook can be found at: https://measure.axler.net/MIRA.pdf

Other common textbooks, which we will not use:
   Real Analysis: Modern Techniques and Their Applications, by Gerald B. Folland

   Real & Complex Analysis, by Walter Rudin

   Real and Functional Analysis (Graduate Texts in Mathematics) (v. 142), by Serge Lang

   Measure and Integral: An Introduction to Real Analysis, by Richard Wheeden and Richard L. Wheeden

   Real Analysis, by Halsey Royden and Patrick Fitzpatrick

Description: (From the course catalog) The real number system, transfinite numbers, spaces, point sets in metric spaces, sequences and series of functions, measure. Lebesgue integration, convergence theory, inversion of derivatives.

Homework assignments: Homework will be assigned in class and completed by groups of 2 or 3 students. For the first few homework assignments these groups will be assigned. Students will then form their own groups of size 2 or 3, with instructor approval, which will be kept for the rest of the semester.

   All assignments must be typed using LaTeX and the .tex file must be submitted to me by the assignment deadline. The LaTeX file must compile. Late homework will be accepted with full credit, but under no circumstances will assignments be accepted after December 7th.

   An up to date schedule, including due dates of homework assignments, can be found on the course website.

Grades: The course will have two midterms (one take-home exam and one oral exam), each constituting 20% of the grade, the homework will also constitute 20% of the grade, and the final exam (an in-person written exam) will constitute the remaining 40% of the grade. No alternate date for the final exam will be given.

Attendance: (from the student handbook) It is in the interest of every student to attend all class sessions; each student has an obligation to contribute to the academic performance of all by full participation in the work of each class. Students are therefore expected to attend all scheduled meetings of classes in which they are enrolled. At the beginning of the session, each instructor will explain the policy regarding absences, and thereafter will report to the office of the appropriate Dean the name of any student whose achievement in a course is adversely affected by excessive absences. In such cases, the Dean, in consultation with the instructor, will take appropriate action, which may include dropping the student from the class. Students dropped after the deadline for withdrawal receive the grade of F. Class attendance may be a factor in determining the final grade in a course.

Colloquia: Graduate students are expected to attend all math department colloquia. The Mathematics Colloquium is a unique opportunity for students to learn about recent developments in mathematics and to see what mathematicians do after they graduate. Each colloquium speaker is asked to present their research to a general mathematics audience that includes graduate students. Therefore, the math department colloquia should be generally accessible. Admittedly though, some speakers are better at accomplishing this task than others.

Seminars: Students are also welcome to attend any of the weekly seminars in the mathematics department. This is a great way to learn about the different groups within the department, which will be helpful in choosing a specialty. Unlike for the colloquia, seminars are where experts in a specific area will present their research to mathematicians who are already familiar with the basic concepts in that area. Because of this specificity, students should not be discouraged if they initially understand very little of what goes on in a seminar.