

**Math 6310: Introduction to Real Analysis I**  
**Fall 2018**

**Class meetings:** MWF 3:00-3:50 p.m. in ECCR 108

**Instructor:**

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<http://math.colorado.edu/~packer/186310.html>

**Office hours:** MWF, 1:00 p.m. - 2:00 p.m., or by appointment

**Prerequisites:** Math 3001 and 4001 (Analysis I and Analysis II), or the equivalent

**Text:** *Real Analysis, Modern Techniques and Their Applications*, Gerald B. Folland, John Wiley and Sons, 1999, Second Edition. We will cover most of Chapters 0–3.

**Course outline:** This course is meant to familiarize the student with the analysis of functions of a single real variable, with an emphasis on Lebesgue measure and Lebesgue integration on the real line, together with their relationship to differentiation. Topics to be covered include: the historical development of the Lebesgue integral, a review of set theory, the structure of open sets and Borel sets on the real line, the notion of a measure space,  $\sigma$ -algebras of subsets, measures on  $\sigma$ -algebras, outer measures, Borel measures on  $\mathbb{R}$ , measurable functions, definition of integration of nonnegative measurable functions with respect to a measure, integration of real-valued and complex-valued integrable functions, convergence theorems for integration, product measures, Lebesgue measure on  $\mathbb{R}$ , Lebesgue measure on  $\mathbb{R}^n$ , functions defined by integrals and convolution, signed measures, absolute continuity and mutual singularity of one measure with respect to another, the Lebesgue-Radon Nikodym theorem, complex measures, differentiation on Euclidean Space, functions of bounded variation.

**Grading:** Grades will be based on two in-class midterms (20% each), homework assignments assigned every two weeks or so during the course of the semester, consisting both of problems from the text and other problems (25%), and a comprehensive final exam (35%). Late homework will not be accepted.

**Test and exam dates:**

Midterm 1: Wednesday, October 3, in class

Midterm 2: Monday, November 5, in class

FINAL EXAM: Tuesday, December 18, 7:30 p.m. – 10:00 p.m. in class.

THERE WILL BE NO MAKE-UP EXAMS, so make sure now that you have no conflicts!

### **Friendly advice:**

- **Come to class.** Things will often be said in class that are not covered in the text, and participating in classroom discussions is an important part of the learning process.
- **Read the book.** The text is intended to be read *in addition to* classroom lectures, and it contains many more details and examples than are possible to cover in lectures.
- **Do the homework.** Not only does it count for a significant portion of your grade, but this is one of the best ways to study and learn.
- **Come to office hours.** I am happy to help you with the homework, or discuss anything we've done in class.

### **Other important Dates:**

- **September 12 (Wed.):** Last day to drop a course without the instructor's signature, and without being assessed tuition and fees for that course and having a W appear on the transcript for that course.
- **November 2 (Fri.):** Last day to drop a course in MyCUInfo. Tuition and fees apply, and a W grade is posted to the transcript.

**Accommodations for disabilities:** If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to me in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website.

**Religious observances:** Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, assignments will either be rescheduled or dropped from grading calculations depending on the nature of the conflict. If you have a conflict, please advise me as soon as possible so that arrangements can be made. See full details at <https://www.colorado.edu/policies/observance-religious-holidays-and-absences-classes-andor-exams>

### **Miscellaneous University Rules & Regulations:**

- **Honor Code:** All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website <https://www.colorado.edu/osccr/honor-code>

- **Classroom behavior policy:** Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the Student Code of Conduct at <https://www.colorado.edu/policies/student-classroom-and-course-related-behavior> and <https://www.colorado.edu/osccr/>
- **Sexual misconduct, discrimination, and/or related retaliation policy:** The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website <https://www.colorado.edu/institutionalequity/>  
Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.