

Math 4001–001/Math 5001-001, Analysis II
Fall 2021

Class meetings: MWF 9:10 a.m.-10:00 a.m. in ECCR 118

Instructor:

Dr. Judith Packer
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<http://math.colorado.edu/~packer/math4001Fall2021.html> and on Canvas

Office hours: MWF, 10:30 a.m.- 11:30 p.m, or by appointment via ZOOM.

Prerequisites: This course has as a prerequisite the courses Math 3001 Analysis 1, and Math 2130 or Math 2135 or APPM 3310 (min grade C).

Text: “*Undergraduate Analysis*”, Serge Lang, Second Edition, Springer, 2005. An e-copy of this book is available for download through the university system. We will cover part of Chapter V, all of Chapter IX, all of Chapter XV, and parts of Chapters XVII and XVIII.

Course outline: This course is meant to continue to familiarize the student with the theory of functions of one or more real variables, with an initial emphasis on sequences and series of functions and different types of convergence, and with a continuation into the theory of vector-valued functions of vector variables, including the inverse function theorem and the implicit function theorem. Topics to be covered include: a rigorous treatment of infinite series of real numbers, sequences and series of functions, convergence and uniform convergence of sequences and series of functions, Taylor’s Theorem, a brief review of vector spaces, in particular, n -dimensional Euclidean space; differentiation, including the definition of the total derivative and the chain rule; the mean value theorem, the inverse mapping theorem, and the implicit function theorem.

Assessment: Grading: Grades will be based on two midterm exams (22.5% each), one of which will be in-class and one of which will be take-home, weekly homework assignments consisting mostly of problems from the text with some in-class presentation (25%), and a comprehensive final exam (30%). Students taking Math 5001 will have some extra homework problems and their take-home exam will be different from those taking Math 4001.

Midterm and final exam dates:

In-class Midterm 1: Wednesday, Sept. 29, 2021, 9:10 a.m.- 10:05 a.m.

Takehome Midterm 2: given out Wednesday, November 3, 2021, 10 a.m., due Wednesday November 10, 2021 11:59 p.m. uploaded to Canvas. Exams will be different for Math 4001 and Math 5001.

In-class FINAL EXAM: Wednesday, Dec. 15, 2021, 7:30 p.m. - 10 p.m.

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

Homework: 25% of your final grade will be come from your performance on homework, which will be assigned every week. Some, but not all, of the problems will be graded. Pdf files of your homework solutions should be uploaded to the class Canvas page by 11:59 p.m. on the homework due date. **Late homework will not be accepted**, but the two lowest grades of your homework assignments will be dropped.

Friendly advice:

- **Attend 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 my office hours in person or via ZOOM.** I am happy to help you with the homework, or discuss anything we've done in class.

Important Dates:

- **September 8, (Wed.):** Last day to drop a course without Tuition/Fee charges and without a "W" appearing on your transcript.
- **October 29 (Fri.):** Last day to drop a course via MyCUInfo; Last day for students to make arrangements with their instructor if they have three or more final exams on the same day or two final exams scheduled to meet at the same time.
- **December 9 (Thurs.):** Last day for students to withdraw from the university for Fall semester 2021. All withdrawals are assessed 100% of tuition and fees (\$0 refund) and W grades are posted to transcripts.

Accommodations for disabilities: If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member 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,

<http://disabilityservices.colorado.edu/> .

Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions at <https://www.colorado.edu/disabilityservices/students/temporary-medical-conditions> on the Disability Services website.

Religious holidays: 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-absences-classes-or-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 academic integrity policy. Violations of the Honor Code may include, but are not limited to: 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 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 on the Honor Code website: <https://www.colorado.edu/sccr/honor-code> .

- **Classroom behavior policy:**

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. 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. For more information, see the policies on classroom behavior and the Student Conduct & Conflict Resolution policies at

<http://www.colorado.edu/policies/classbehavior.html>

and

<https://www.colorado.edu/sccr/>, respectively.

- **Preferred Student Names and Pronouns:**

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

- **Requirements for COVID-19** As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policy on classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the Accommodation for Disabilities statement on this syllabus.

As of Aug. 13, 2021, CU Boulder has returned to requiring masks in classrooms and laboratories regardless of vaccination status. This requirement is a temporary precaution during the delta surge to supplement CU Boulders COVID-19 vaccine requirement. Exemptions include individuals who cannot medically tolerate a face covering, as well as those who are hearing-impaired or otherwise disabled or who are communicating with someone who is hearing-impaired or otherwise disabled and where the ability to see the mouth is essential to communication. If you qualify for a mask-related accommodation, please follow the steps in the Accommodation for Disabilities statement on this syllabus.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home. Because this class is taught in person, if you are quarantined, please get in touch with me if you must miss class, and I will inform you of the material being covered. If you become ill with COVID-19, please inform the CU Medical Services Public Health Office and follow CU Medical Services Public Health protocols.

Once a student discloses to me that they have tested positive for COVID-19 or are having symptoms of COVID-19 or have had close contact with someone who has tested positive for COVID-19, I will submit that information to the Medical Services Public Health Office for the purposes of contact tracing (contacttracing@colorado.edu and/or 303-492-2937), as required by CU Health policies and procedures.

- **Statement on Discrimination and Harassment:**

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or 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. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website,

<http://www.colorado.edu/odece/>

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.