

Instructor and contacts: Prof. Stephen Becker, ECOT 231, (303) 492-0662, stephen.becker@colorado.edu. I will respond to most reasonable email, but (1) lengthy questions should be posed at office hours and not via email, and (2) I will not check email at odd hours or just before homework is due.

Meeting times: Monday, Wednesday and Friday, ECCR 131, 1:00 PM to 1:50 PM.

Office hours: Tues 3-3:30 PM; Wed 4:30-5 PM; Thurs 1-2 and 4-5 PM.

Course Content and Goals: The course is a continuation of the first semester APPM 5440. The emphasis this semester is on Fourier series and Fourier Transforms, Sobolev spaces and weak derivatives, basic measure theory, and the function spaces $L^p(\Omega)$. Thought-process and proof technique are emphasized over memorization of definitions. The course is designed hand-in-hand with the applied analysis qualifying exam for applied math graduate students.

The course is *applied* analysis because the topics are selected to be useful for applied mathematicians, and not because we will discuss applications in depth. For example, in comparison with a graduate class in analysis in the math department, we will emphasize topics like Fourier analysis and existence of solutions to differential equations, and not cover topics like non-metric topologies or discuss the axiom of choice.

Text: *Applied Analysis* by John K. Hunter and Bruno Nachtergaele. Real analysis and measure theory texts, such as those by Kolmogorov and Fomin, or Royden, may also be useful, but are optional.

Syllabus: Roughly, chapters 7–12 (later ch. 10) of the text. In particular, we will cover all of the material in chapters 7 and earlier that is mentioned at <http://tinyurl.com/juhaw5k>.

Recitations: There are no recitation session.

Exams: No midterms. The final exam is Sunday, May 6 2018 from 7:30 PM to 10:00 PM (closed book).

Grading: There will be weekly homeworks (60%), Friday quiz/participation (10%), and a final exam (30%).

Each **homework** will have two types of problems:

- **Collaboration** problems: collaboration with your fellow students is OK and in fact recommended, although direct copying is not allowed. The internet is allowed for basic tasks (e.g., looking up definitions on wikipedia) but it is not permissible to search for proofs or to post requests for help on forums such as <http://math.stackexchange.com/>. On these problems, please write down the names of the students that you worked with.
- **No collaboration** problems (mini open-book take-home exams): collaboration with anyone is forbidden. Internet usage is forbidden. You can ask the instructor questions though.

For both types of homework, you may use the course book or the supplemental books by Kolmogorov and Fomin or Royden, but no other books. On each homework, an **arbitrary selection of problems will be graded**. Within each category of homeworks, all homeworks are worth an equal amount of weight; each category by itself is worth 30% of the overall course grade. Grades will be available on [canvas](#).

Every Friday, there will be a small activity, such as group-work, a written quiz (peer-graded), or presentations of proofs. The grade is roughly all-or-nothing, and each week is weighted equally. If you must miss a Friday lecture, let the instructor know and you'll receive credit if the absence is for a legitimate reason (sickness, conference travel, etc.).

Late homework policy: Homework is due at the beginning of class. Late homework is not accepted. Your lowest scoring homework is automatically dropped from the final grade calculation (and for this purpose, the collaboration/no-collaboration homeworks will be treated separately).

Homework correction policy: If you have a low score on a homework, you are eligible to do "homework corrections" to improve your score. Here are the details:

1. The collaboration and no collaboration problem sets are treated completely independently, as if they were both separate homeworks. You may do corrections on either or both.

2. A homework is only eligible if you scored 75% or less on it. If you successfully complete the corrections, you will receive back half the missing points. E.g., if you have 12/20, then your grade will move to 16/20.
3. The format of a correction is a 15 minute oral presentation. Students may arrange a meeting with the instructor, or come during office hours. During the presentation, the instructor will be free to choose any problem from the homework set (not restricted to problems that had a poor score, or even problems that were graded), and the student must present the proof on the whiteboard.
4. Students may only do one correction per week. It may be on any homework from the semester, but students cannot correct several homeworks at once with the exception that you can correct both no-collaboration and collaboration from the same homework set, in which case you can do both in 1 week, and it will be in one 20 to 30 minute session.
5. Students are only eligible to correct a homework set if they turned it in and attempted a reasonable number of problems. If you do not turn in a homework, you can never recover the lost points. Students are allowed one dropped homework (one collaboration, one no-collaboration) per semester.

Course web page: (course website: <https://tinyurl.com/y7ckqrzp>) It is your responsibility to check the web page on a regular basis. Here you will find detailed information such as homework assignments and solutions, office hours, and special announcements. In addition, it contains policies on illness, academic honesty, and special accommodations for religious holidays and documented special needs. We may also use Canvas (<https://cuboulder.instructure.com/courses/15665>) in addition to the main course website.

Dropping the course: Advice from your department advisor is recommended before dropping any course. After Jan. 31, dropping a course results in a “W” on your transcript. After Mar. 23, dropping the course is possible only with a petition approved by the Dean’s office.

Academic Honesty and Collaboration policy: Violation of the CU Student Honor Code (colorado.edu/policies/student-honor-code-policy) will result in an automatic final grade of F in this course. For the collaboration-allowed homework, students can, and should, study with others, however, **all work turned in must be your own**. Please write down the names of students that you worked with. On the no-collaboration homework section, and on the final exam, absolutely now work with others is allowed. See next page for more details on the Honor Code.

The following policies are standard CU-Boulder policies

Disability: 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](#). 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 and discuss your needs with your professor.

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, there should be little conflict since the grade is based on homeworks and a single final exam. If you must miss the final exam due to religious reasons, talk to the professor at the beginning of the semester to make special arrangements. If the homework is due on the date of a religious holiday, you are expected to turn the homework in early. If you have a religious holiday that lasts longer than one week, and so therefore you would not receive the homework with enough time to turn it in early, talk to the professor at the beginning of the semester. See the [campus policy regarding religious observances](#) for full details.

Classroom behavior: 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](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the [OIEC website](#).

Honor code: All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [academic integrity policy](#). Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at the [Honor Code Office website](#).

Note: sanctions for first-time offending **graduate students** are typically more severe than for first-time offending **undergraduate students**, since graduate students are held to higher standards.