Course Description and Objectives

Analysis is a **powerful** and fundamental branch of mathematics that extends calculus to more general settings. Despite the name, this course in **applied** analysis is actually a theoretical course which, together with Applied Analysis II (APPM 5450), is intended to give you platform on which applied methods can be built. It will cover metric and normed spaces, continuous functions, $L^p$ spaces, the contraction mapping theorem, Banach spaces, Hilbert spaces, and the existence and uniqueness of solutions to various types of differential and integral equations.

### Instructor
Jem N. Corcoran
[corcoran@colorado.edu](mailto:corcoran@colorado.edu)*

* E-mailing homework questions is welcomed and encouraged!

### Resources

**Text:** Applied Analysis
by J.K. Hunter and B. Nachtergaele

**Course Website:** amath.colorado.edu/5440

**Supplementary Text:** Introductory Real Analysis
by A.N. Kolmogorov and S.V. Fomin

### Important Dates

- **9 HW Assignments**
  - Due dates:
    - 9/4, 9/11, 9/18, 9/25
    - 10/2, 10/13, 10/30
    - 11/6, 12/4

- **2 Midterms**
  - Dates: 10/7, 11/11
    - (5:30-7:30 PM)

- **Final Exam**
  - Wed, Dec 16, 4:30-7pm

### Homework Policy:
Homework is due on the listed dates at (or before) the beginning of class and will be accepted up until 5pm on these dates. Homework will no longer be accepted after 5pm on its due date. Your lowest homework score will be dropped.

### Exam Policy:
Midterm exams are in the evenings to allow for more time. Please notify your instructor as early as possible if you are unable to attend the scheduled exam times so that other arrangements can be made. Exams are closed book and closed notes. Practice problems will be provided.

The final exam will be comprehensive with an emphasis (approximately 70% of exam) on material from after the second midterm.

### Overall Grade:
Your overall grade will be determined as 30% homework, 25% for each midterm, and 20% for the final.

### Preliminary Exam:
This course is one of two courses designed to prepare you for the Preliminary Exam in Analysis. (http://amath.colorado.edu/content/applied-analysis-preliminary-exam-syllabus) Throughout the semester we will specifically work many old exam problems both in class and during some optional extra meetings.

### Homework Policy:
Ask lots of questions and get help when you need it—especially if you feel that you are falling behind!

Please visit the course website often for important announcements and useful topic tutorials.

Please see the course website for university policies on honor, discrimination, disability, and religious holidays.

Make sure to always show your work. Collaboration is allowed and encouraged except when explicitly prohibited.

---

"Turn away with fear and horror from this lamentable plague of continuous functions that do not have a derivative."
- Charles Hermite

---

This course covers Chapters 1 through 6 of Hunter and Nachtergaele.