MATH_V 421 / 510 — Real Analysis II

Section 201 / 202 — Winter 2025 Term 2

University of British Columbia, Vancouver Campus

General Information

- **Term dates:** January 5 – April 10, 2025
- **Midterm Break:** February 16 – 20
- **Final Exam Period:** April 14 – 25
  (Students should ensure they are in Vancouver during this period.)

The instructor will be attending a conference in China. **Philip Lowen** will teach the lectures during the week of **February 2–6**.

Lectures

- **Schedule:** Monday, Wednesday, Friday, 11:00 am – 12:00 pm
- **Location:** Mathematics Building (MATH), Floor 2, Room 204

Attendance is not mandatory but is strongly recommended.
In the event that in-person lectures cannot take place, lectures will be held via Zoom:

https://ubc.zoom.us/j/62195754464
Meeting ID: 621 9575 4464
Passcode: 54321

Course Materials

Lecture Notes

Lecture notes will be uploaded on Canvas and updated regularly throughout the term.

Textbook

The primary textbook for this course is:

G. B. Folland, *Real Analysis: Modern Techniques and Their Applications*.

Additional Resources

Summaries and old final exams may be provided as the course progresses.

Tentative Course Outline

(References are to chapters and sections of Folland.)

- Banach spaces: definitions, dual spaces, properties (Sections 5.1–5.3)
- An important family of examples: L^p spaces (Sections 6.1–6.2)
- An important special case: Hilbert spaces (Section 5.5)
- A brief introduction to point-set topology (Sections 4.1–4.2)
- Weak and weak* topologies, operator topologies (Section 5.4)
- Possible further topics (time permitting):
  - Introduction to Fourier analysis (parts of Chapter 8)
  - Introduction to distributions (parts of Chapter 9)
  - Riesz–Markov representation theorem (Sections 7.1–7.3)

Where to Ask Questions

Piazza

Piazza is the main online forum for course questions. Students must sign up using their real names (anonymity to classmates is allowed). Be respectful and refrain from pranks. Students who do not yet have access should email the instructor.

Office Hours

- **Ignacio (TA):** Fridays, 12:00 – 2:00 pm, MATX 1102 (starting January 9)
- **Alexia:** Mondays, 3:00 – 5:00 pm, MATX 1102 (starting January 12)

  Ignacio's office hours may be adjusted if grading demands increase.

Grading Scheme

- **Homework assignments:** 50%
- **Final exam (in person):** 50%

Homework

Homework assignments will be assigned approximately every two weeks (excluding the midterm break) and are due Fridays at 11:59 PM. No late submissions will be accepted.

The lowest homework score (out of six assignments) will be dropped, and the remaining scores will be averaged. *The dropped homework score serves as an automatic academic concession* intended to accommodate short-term illness, personal or emotional difficulties, or other minor unforeseen circumstances.

For serious or long-term issues (such as prolonged illness or hospitalization), students should contact their Faculty advising office and inform the instructor as soon as possible.

Homework solutions must be typed. Using LaTeX (e.g. Overleaf) is strongly recommended.

Final Exam

The final exam will last 2.5 hours and will cover all material from the course. It is closed-book, with no calculators permitted.

Students may bring one letter-sized sheet (8.5×11 inches) of handwritten or printed notes.

There will be **no midterm exams**.

UBC Policies and Resources

Students are expected to be familiar with UBC policies on academic integrity. Academic misconduct will be pursued to the fullest extent.

Students requiring accommodations should register with the Centre for Accessibility (CfA).

Code of Conduct and Best Practices

Students are encouraged to ask questions during lectures, point out possible typos, and participate respectfully.

Treat all members of the class with equal respect and inclusivity.

If you feel ill, please stay home; lecture notes will be provided.

Contact Information

Instructor email (only address used for course correspondence):
`yavicoli@math.ubc.ca`