Mathematics 220 (Mathematical Proof), Fall 2013

Lecture times and locations:

- Section 101: Prof. I. Laba, MWF 12:00-12:50, MATX 1100
- Section 102: Prof. A. Nachmias, MWF 12:00-12:50, Buchanan B313

Lecturer: Prof. I. Laba (Section 101)

- Math Bldg 200, (604) 822 4457, ilaba@math.ubc.ca
- Office hours: Monday 2-3, Wednesday 1-2, Friday 11-12, in MATH 200. (This is a preliminary schedule and may change later.)
- If you cannot attend regular office hours due to schedule conflict, please make an appointment in advance. Drop-ins and same-day requests for appointments cannot usually be accommodated.

Lecturer: Prof. A. Nachmias (Section 102)

- Math Annex 1220, (604) 822 6609, asafnach@math.ubc.ca
- Office hours: Monday 3-4, Wednesday 3-4, and by appointment.

The best way to contact instructors is by email. Please note that email received on evenings and weekends will be answered on the next business day.

Prerequisites: Either (a) a score of 64% or higher in one of MATH 101, MATH 103, MATH 105, SCIE 001 or (b) one of MATH 121, MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.

Course web page: http://www.math.ubc.ca/~ilaba/teaching/math220 F2013

Homework assignments will be posted here.

Textbook: Gary Chartrand, Albert D. Polimeni and Ping Zhang: "Mathematical Proofs - A Transition to Advanced Mathematics", 3rd ed., Pearson / Addison Wesley, 2013. ISBN 978-0-321-79709-4

Course goals: To learn how to construct and write mathematical proofs, with strong emphasis on clarity and mathematical rigour. Specific topics will include:

- Sets: definitions, set operations (Chapter 1)
- Logic: logical connectives, quantifiers (Chapter 2)
- Proofs: direct and contrapositive (Chapters 3 and 4)
- Proofs: existence and contradiction (Chapter 5)
- Induction (Chapter 6)
- Equivalence relations (if time allows; Chapter 8)
- Functions: injective, surjective, bijective, inverses and compositions (Chapter 9)
- Cardinality of sets: finite sets and different types of infinite sets (Chapter 10)
- Elementary real analysis limits of sequences and series, concept of supremums (Chapter 12)

This list is somewhat provisional and may be adjusted as needed. A longer description (developed by Prof. Andrew Rechnitzer) is <u>available as a PDF file</u>.

Your course mark will be based on homework (15%), workshop participation (5%), the midterm exam (30%), and the final exam (50%). The grades may be **slightly** scaled at the end of the course.

Examinations: There will be one in-class 50-minute midterm scheduled on Monday, October 21, and a 2.5 hour final exam in December. The date of the final examination will be announced by the Registar later in the term. Attendance at the final examination is required, so be careful about making other committments (such as travel) before this date is confirmed. All examinations will be strictly closed-book: no formula sheets, calculators, or other aids will be allowed.

Homeworks: There will be 5 homework assignments, due tentatively on September 16, September 30, October 11, November 4 and November 18. Each homework will be announced and posted here at least a week in advance. The homeworks are to be handed in at the **beginning** of class. If you cannot come to class, you may drop off your homework at your instructor's office prior to the start of class. Late assignments will not be accepted. Solutions will be posted on the course webpage immediately after the lecture. To allow for minor illnesses and other emergencies, the lowest homework score will be dropped.

Workshops: Every other week, there will be an in-class workshop led by Dr. Sandra Merchant, Science Teaching and Learning Fellow at UBC, and your instructor. The workshop schedule is as follows:

- Section 101: Fridays, September 13 and 27, October 11, November 1, 15 and 29
- Section 102: Wednesdays, September 11 and 25, October 9 and 30, November 13 and 27

At the end of each workshop, there will be a short 10-minute quiz based on that workshop's problems. Your workshop participation mark will be based on these quizzes.

Academic concession: Missing the midterm, or handing in a homework after the deadline, will result in a mark of 0. Exceptions may be granted in two cases: prior consent of the instructor, or a **documented** medical reason. Your course mark will then be based on your remaining coursework.

Useful links:

- Please read the UBC policy on Student Conduct and Discipline.
- Drop-in Tutorial Schedule
- AMS old final exam database
- <u>UBC Math Club</u>, located in Math Annex 1119, sells math exam packages (old exams together with solution sets) for a nominal price before each final exam session.

[Mathematics Department] [University of British Columbia]