

Mathematics 220

Mathematical Proof

Summer 2023 (2023S1)

Acknowledgement

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the $x^w m \theta k^w \acute{y} \acute{e} m$ (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next.

Course information

An introduction to standard techniques of mathematical proof.

Instructor

- Andrew Rechnitzer
- All classes in Mathematics Annex 1100
- Tuesday, Thursday, Friday 11-12:50
- Wednesday 11-11:50

Important term dates

- First day of teaching: Tuesday May 15
- Last day of teaching: Thursday June 22

Course webpage

- [course webpage](#)

Prerequisites

- a score of 64% or higher in one of MATH 101, MATH 103, MATH 105, SCIE 001, or
- one of MATH 121, MATH 200, MATH 217, MATH 226, MATH 253, MATH 254.

Topics

The course will cover (approximately)

- Sets
- Basic logic
- Direct and contrapositive proofs
- Quantifiers
- Induction
- More sets
- Equivalence relations
- Functions
- Proof by contradiction
- Cardinality and infinite sets

Throughout the term we will emphasise both the mathematical correctness, and also the importance of clarity of presentation of mathematics.

Text

- The course will follow [PLP - An introduction to mathematical proof](#) by Demirbas and Rechnitzer - with exercises contributed by Kohut and Trainor.
 - It is a free [online text](#) (which you can also [download as PDF](#) if you want).
 - It was developed at UBC for this course and was partially funded by [UBC's OER fund](#)
 - You can even look at the [source code](#) if you want.
 - The text also has links to set of short [video lectures, slides and worksheets](#)
 - We also recommend the [book of proof](#) by Richard Hammack - it is also free to download.
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Assessment

Breakdown of marks

- 10% Homework - two each week
- 30% Midterms
 - First = Wednesday of Week 3
 - Second = Wednesday of Week 5
- 60% Exam - in the end-of-June exam period

Videos

- *Before* you come to class you should watch some videos on the material - we'll tell you which ones.
- You can find all the videos [in a big list here](#).
- The slides from the videos are also there.

Homework

- See the Canvas page for details
- We will give around 12 homework assignments - starting from the very first week!
- There will be two each week - one due on Thursdays and the other on Sundays (before 11:59pm)
- I will try to post all homeworks well in advance.
- We will not accept late homework.
- There will be no "make up" homeworks.
- Instead your homework score will be taken from your best 8 homework assignments.
- Note that if you miss a significant number of homework assignments due to valid reasons then part of the weight of the homework will be put onto the exam.

Presentation of homework

- One of the main goals of mathematics 220 is to teach how to present and communicate mathematics precisely and correctly.
- Accordingly handwritten or messy homework will not be accepted.
- **Homework must be typeset and submitted as a PDF through Canvas.**
- We recommend that you use latex to prepare your homework

- If you don't know how to use LaTeX, we will provide you with some basic templates to get you started
- We recommend using [Overleaf](#) (which you can do free of charge) or (if you feel up to the challenge) [installing it on your own computer](#).

Midterms - May 31 and June 14

- The midterms will be in regular class time on the Wednesday of Week 3 and Week 5.
- See the [course webpage](#) for details closer to the date.
- Note - there is no "make up" midterm - if you miss the midterm due to valid reasons, the weight of the midterm is passed onto the exam.

Exam

- See the [course webpage](#) for details closer to the end of term.
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General syllabus information

The Mathematics Department has standard syllabus information. This includes standardised policies for

- academic concessions (ie missed homework + midterm)
- academic integrity (ie cheating)
- registration issues (your instructors have no control over anything to do with registration)
- misc student resources

You can find that information [here](#)