

Mathematics 220

Mathematical Proof

September-December 2022 (2022WT1)

Acknowledgement

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the $x^w m \theta k^w \acute{a} y \acute{a} m$ (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.

Instructors

section	instructor	time	location
101	Elyse Yeager	MWF 12	CHEM-D200
103	Andrew Rechnitzer	MWF 10	EOS-2012
104	Elyse Yeager	MWF 3	MW in EOS-2012 and F in BUCH-A104
105	Andrew Rechnitzer	MWF 2	CHEM-D300

section	instructor	time	location
107	Omer Angel	TuTh 930	BUCH-B315
108	Nahid Walji	TuTh 1230	CHEM-D300

Important term dates

- First day of teaching: Wednesday September 07
- Last day of teaching: Wednesday December 07
- University closed on
 - September 30 (National Day for Truth and Reconciliation)
 - October 10 (Thanksgiving Day) and
 - November 09-11 (Remembrance Day and midterm break)

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

- 5% weekly short quizzes on Canvas
- 15% Homework - one each week
- 20% Midterm - October 19th and 20th during class.
- 60% Exam - in the December exam period

Canvas quizzes

- There will be two very short Canvas quizzes each week - starting from the very first week!
- The quizzes are designed to help you keep up to date with material and come to class prepared.
- *Before* you attempt the quizzes, 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 10 or 11 homework assignments - starting from the very first week!

- Homeworks will be posted on Thursday evenings and due on Thursdays before 11:59pm (ie around 1 week later)
- 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](#).

Midterm - October 19th & 20th

- People in MWF classes will have the midterm on Wednesday the 19th, and those in TuTh classes will have it on Thursday the 20th.
- 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.

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](#)