Acknowledgement

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (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 on this site.

Course Information

Course Title	Course Code Number	Credit Value
Mathematical Research and Writing	MATH 444	3

Prerequisites

One of MATH 220, MATH 226 and 6 credits of MATH courses numbered 300 or higher.

Corequisites

There are no corequisites.

Contacts

Course Instructor(s)	Contact Details	Office Location	Office Hours
Stephanie van Willigenburg	Tel: (604) 822-2630 Email: steph@math.ubc.ca	MATH 208	Mon 10-11am, Thur 4-5pm, 15 mins just after class, and by appointment (not Wed). You can also email me anytime.

Other Instructional Staff

None.

Course Structure

This is for students who would like an introduction to mathematical research, and are interested in exploring mathematics constructively. It is suitable for students who would like to further develop their critical thinking skills independently. In addition presentation skills and ability to professionally typeset mathematics will be developed.

This course is lecture based, integrated with in-class activities such as small group work, question and answer sessions, and student lectures. There will be one project due at the end of the course, supported throughout the term with feedback via drafts, and weekly research journals due on Fridays. There will be a weekly homework assignment due on Thursdays at the start of class, and posted on the course website approximately 2 weeks in advance.

Time and location: TuTh 9.30-11.00 MATH 202.

Web page: http://www.math.ubc.ca/ steph/444/444.html

Due to the unique structure of the course each section will be run independently.

Schedule of Topics

Week 1

Proof techniques: Induction, constructive, contradiction

Week 2

More proof techniques
How to research

Week 3

How to LaTeX
How to present

Week 4

Practice presentations

Week 5

Types of statement
How to write

Week 6

Group reflections

Week 7

How to cite/How to read
Plagiarism

Week 8 onwards

Student lectures

If changes occur then students will be informed.

Learning Outcomes

By the conclusion of the course students will have achieved the following.

Research

1. Developed a research program.
2. Created conjectures and then proved conjectures.
3. Reviewed and augmented proof techniques: vacuous, trivial, construction, contrapositive, cases, existence, counter example, induction.
4. Appraised the correctness of a proof both of others and of self.
5. Discovered how to proceed when stuck on a problem.
6. Developed collaborative skills.

Writing

1. Differentiated between different mathematical statements, and constructed them.
2. Structured an article globally and locally, avoiding common errors.
3. Typeset in LaTeX and Beamer.
4. Learned how to record research progress through journals.
5. Appraised other technical writing and presentations.
6. Structured, wrote and presented mathematics lectures of varying lengths, both stand alone and team taught.

Learning Activities

There will be in-class activities such as small group work, question and answer sessions, and student lectures.

Learning Materials

Any learning materials will be provided to students free of charge.

Assessments of Learning

Your grade will be based on the following.

- Class participation and peer feedback (5%).
- Homework (10%): Due in at the start of class each Thursday.
- Research journal (10%): Due electronically at 11.59am each Friday.
- Presentations (30%).
- Project (45%).

Due to the intense workload of the course no extensions will be given, and late submissions will be subject to a 50% per day penalty.

University Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the `https://senate.ubc.ca/policies-resources-support-student-success`UBC Senate website.

Other Course Policies

Academic misconduct: Regardless of whether you arrive at homework solutions in collaboration with others or alone, the paper that you turn in with your name on it should represent your own solutions, written in your own words. In particular, you may not simply copy someone else's homework and turn it in as your own. Similarly, copying solutions that you might find on the web or from some other source is illegal. The same applies to every result at every stage of your project.

These will all be treated as academic misconduct. We take all academic misconduct very seriously and will follow university procedures in all cases - disciplinary measures can result in expulsion.

Class etiquette: Use of cell phones (in any manner), laptops, smartphones, tablets and other electronic devices during class is highly inappropriate, as it is distracting and disrespectful to fellow students and the instructor. Chatting with neighbours, even when whispered, is equally inappropriate. If you have a question then please ask the instructor so the whole class may benefit too.

Arriving late and leaving early is also discouraged. If it happens then please enter/leave the room silently and do not disrupt the other students or instructor.

Learning Analytics

In this course, data from grades will be used to:

- View overall class progress
- Track individual progress in order to provide personalized feedback.

Learning Resources

The Mathematics Department has a Math Learning Centre located on the Agricultural road between West Mall and Main Mall on the third floor of the Leonard S. Klinck Building (LSK) in Rooms 301 and 302.

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