

THE UNIVERSITY OF BRITISH COLUMBIA OKANAGAN

MATH 220: Mathematical Proof (2021 Winter Term 1) ¹

Logistical Information

All course information will be maintained and updated on: <http://canvas.ubc.ca>

To access student support, FAQs and additional info, visit <http://students.canvas.ubc.ca>

Instructor: Dr. Heinz Bauschke

Teaching Assistant: Shambhavi Singh

Contact: Email heinz.bauschke@ubc.ca Use “MATH 220” as subject

Do not call my office phone (and do not leave a message)! I only very infrequently check my office phone.

Lectures: MWF 10:00-11:00 (usually live on zoom, lecture recording posted on zoom afterwards).

I recommend developing your own set of notes.

Office Hours: Thursdays 9:00–10:30 and 1:30–3:00 on zoom (tentatively, starting September 16, 2021).

Textbook: No textbook is required. The notes are distributed on **canvas**.

Course Outline and Key Dates

This course requires registration in a tutorial activity as well as the lecture section.

Calendar Description: “Sets and functions; induction; cardinality; properties of the real numbers; sequences, series and limits. Logic, structure, style and clarity of proofs emphasized throughout.” (3 credits, Pre-requisite is MATH 101)

Course overview, content and objectives: We shall cover almost all of the material of the course notes provided. The objective of this course is to make the student able to do proofs in set theory, and convergence of sequences and series. This is fundamental importance for 3rd and 4th year courses.

Learning outcomes: Mastering of proof techniques and material from beginning Set Theory and Analysis.

Tentative course schedule: We shall (very roughly) cover a chapter per week from the course notes.

Sept 8, 2021: First lecture.

Oct 13, 2021: Term Test I during class time (on zoom).

Nov 19, 2021: Term Test II during class time (on zoom).

Dec 6, 2021: Last lecture.

Final Exam (on zoom): December TBA, 2021, Details TBA

Midterm break and other calendar dates can be found at: <http://www.calendar.ubc.ca/okanagan/>

Evaluation

Homework: 45%

Tutorial: 15%

Term Tests (two): 10% total (each is worth 5%)

Final Exam: 30%

Passing Criteria: course grade of 50% or higher.

Homework (45%)

Homework is (usually) due on Saturdays at 11:00 pm. **Homework must be submitted on canvas as one pdf.**

Homework sent by email WILL NOT be accepted. Assignments are marked for completeness, correctness, and clarity for a few selected questions. **LATE ASSIGNMENTS RECEIVE NO MARKS but may receive feedback.** Your worst two assignments will be discarded when computing the homework portion.

Tutorial (on zoom, 15%)

You are expected to attend (8%), participate in discussions, and answer questions. The quality of your two required responses is worth 6% (3% each); 1% can be obtained for overall participation or answering harder questions. There is no penalty in the tutorial attendance portion if you miss up to 2 tutorials. If you do miss 3 or more tutorials, then contact me with appropriate documentation.

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Term tests (on zoom, 10%)

Term tests will be held during class time on the days listed. Each term test is worth 5% of your course grade.

No electronic aids are permitted on the term tests to help you with questions. This includes calculators, cell phones, watches, and other such devices. You are not allowed to communicate with other students or consult any notes. I expect you will have access to zoom during the exam.

No make-up term tests will be provided. If you miss a term test, a valid medical reason (or similar) must be provided. If a valid medical reason (or similar) is presented, then that term test's weight on the final course grade will be shifted to the final exam.

Final Exam (on zoom, 30%)

No electronic aids are permitted on the term tests. This includes calculators, cell phones, watches, and other such devices. You are not allowed to communicate with other students or consult any notes.

All tests and examinations are closed-book

The examinations in this course are all **closed-book**, so you are **NOT** permitted to access any of the course materials, including your notes, during the exam. You are **NOT** to use any search engines or other programs except for the program required to complete the exam. You are also NOT to communicate with anyone about the exam during the scheduled write time or after the examination – you are to work independently. Communication with other students (written, text, verbal, etc.) is not permitted and will constitute Academic Misconduct. If you violate these conditions you have engaged in Academic Misconduct and will be subject to the consequences articulated in the Academic Integrity section below.

Students might be asked to acknowledge an academic integrity pledge prior to completing the examination. The instructor reserves the right to use appropriate software for exam invigilation.

Technology required

In order to engage fully with this course online, students are required to have a laptop or desktop computer and a stable Internet connection. Students are encouraged to check out this link: <https://keeplearning.ubc.ca/setting-up/> You will need have software to create a single pdf of your homework or tests to be submitted online. Look into appropriate scanning software and make sure that the pdf produced is not overly large.

Technical Support Resources

There are a number of supports on campus to assist students with technical issues. Students are encouraged to familiarize themselves with the software required for their courses. Instructors are also encouraged to have contact information for technical support available, should students reach out for support. For example, the Student Learning Hub's technical support <https://students.ok.ubc.ca/academic-success/learning-hub/tech-support-for-online-learning/>

Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>

Final Examinations

The examination period for the Winter 1 term is December 11, 2021 to December 22, 2021. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on **Academic Concession** can be found under **Policies and Regulation in the Okanagan Academic Calendar** <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at: <http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>.

Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and Students <http://copyright.ubc.ca/requirements/copyright-guidelines/> and UBC Fair Dealing Requirements for Faculty and Staff <http://copyright.ubc.ca/requirements/fair-dealing/>. Some of these figures and images are subject to copyright and will not be posted to **Canvas**. All material uploaded to **Canvas** that contain diagrams and figures are used with permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for Faculty and Staff. Access to the **Canvas** course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor. If the complaint is not resolved to the student's satisfaction, the student should e-mail the Associate Head of Mathematics and Statistics, Dr. Sylvie Desjardins at sylvie.desjardins@ubc.ca or the Department Head pro tem, Dr. Andrew Jirasek at andrew.jirasek@ubc.ca

Student Service Resources

Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, e-mail us or visit our website for more information.

Web: <http://students.ok.ubc.ca/drc/welcome.html> **E-mail DRC at:** drc.questions@ubc.ca

Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights-based discrimination and harassment. If you require assistance related to

an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit's equity representative. **UBC Okanagan Equity Advisor: ph. 250-807-9291**

Web: <https://equity.ok.ubc.ca/>

E-mail: equity.ubco@ubc.ca

Health & Wellness - UNC 337

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.

Web: www.students.ok.ubc.ca/health-wellness

Email: healthwellness.okanagan@ubc.ca

Sexual Violence Prevention and Response Office (SVPRO)

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit svpro.ok.ubc.ca or call us at 250-807-9640

Independent Investigations Office (IIO)

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the IIO. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the IIO by calling 604-827-2060.

Web: <https://investigationsoffice.ubc.ca/>

E-mail: director.of.investigations@ubc.ca

The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies.** **Web:** (<https://students.ok.ubc.ca/student-learning-hub/>) **Ph:** 250-807-9185.

SAFEWALK - Download the UBC SAFE – Okanagan app.

Don't want to walk alone at night? Not too sure how to get somewhere on campus?

Call Safewalk at 250-807-8076 For more information: <https://security.ok.ubc.ca/safewalk/>