

MATH 302: Introduction to Probability

Instructor: Mathav Murugan (email: mathav@math.ubc.ca)

Lectures: MWF 11-12 Lectures will be recorded and made available on Canvas.

Dates: Jan 11, 2021 to Apr 14, 2021

Office hours: Please see Canvas for the Zoom link to office hours.

Course webpage: We will use Canvas <https://canvas.ubc.ca/courses/60633>

Text: We follow the book “Introduction to Probability” by Anderson, Seppäläinen, and Valkó. An alternate reference is and S.M. Ross, “A First Course in Probability”.

Outline.

Some highlights of the course include

1. sample spaces, events, axioms of probability (Chapter 1)
2. independence and conditional probability, Bayes formula (Chapter 2)
3. discrete and continuous random variables, expectation and variance (Chapter 3)
4. approximations of binomial distribution (Chapter 4)
5. transformation of random variables (Chapter 5)
6. joint distribution and conditional distribution (Chapter 6)
7. covariance and correlation (Chapter 8)
7. moment generating function (Chapters 5 and 8)
8. Chebycheff inequality (Chapter 9)
9. law of large numbers and central limit theorem (Chapters 4 and 9)

I will post lecture notes on Canvas after each lecture.

Assignment: Homework will be given regularly according to the following schedule. The assignments are due before the class begins on Canvas.

Assignment given	Assignment due
January 15	January 22
January 22	January 29
January 29	February 5
February 5	February 12
February 26	March 5
March 5	March 12
March 12	March 19
March 19	March 26
April 2	April 9

Students may work together to understand the problems, but are expected to write their solutions independently. No two homeworks should look identical. Students may research concepts online, but may not use solutions which are found online

Tests: There will be two 50-minute tests held during the regularly scheduled class hours on the following dates:

Wednesday, February 24, Wednesday, March 31.

The tests and final will be invigilated via Zoom and it is absolutely necessary for every

student to have a webcam. If a student does not have a webcam in their computer, they will not be able to complete the course.

Missing an assessment without a valid reason results in a mark of zero. Missing an assessment for a valid reason normally results in the weight of that assessment being transferred to the final exam. Examples of valid reasons include illness and travel to play a scheduled game for a varsity team. Examples of reasons that are not valid include conflicts with personal travel schedules or conflicts with work schedules. Any student who misses an assessment is to present to their instructor the Department of Mathematics self-declaration form for reporting a missed assessment within 72 hours of the assessment date. The form is here: https://www.math.ubc.ca/Ugrad/ugradForm/Student_Declaration_Academic_Concession_MATH.pdf. This policy conforms with the UBC Vancouver Senate's Academic Concession Policy V-135 and students are advised to read this policy carefully: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0>.

Final exam: There will be a final held on zoom during the examination period.

Evaluation: The final mark will be calculated as follows:

Assignments: 15% (lowest assignment score will be dropped)

Tests: 25% each Final exam: 35%

Prerequisites: You must have taken one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.

Academic integrity: By enrolling as a student at UBC, you have agreed to abide by the University Rules on Academic Honesty. Here is what you have agreed to and are bound by: "Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action. It is the student's obligation to inform himself or herself of the applicable standards for academic honesty. Students must be aware that standards at the University of British Columbia may be different from those in secondary schools or at other institutions. If a student is in any doubt as to the standard of academic honesty in a particular course or assignment, then the student must consult with the instructor as soon as possible, and in no case should a student submit an assignment if the student is not clear on the relevant standard of academic honesty. If an allegation is made against a student, the Registrar may place the student on academic hold until the President has made his or her final decision. When a student is placed on academic hold, the student is blocked from all activity in the Student Service Centre."

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 UBC Senate website <https://senate.ubc.ca/policies-resources-support-student-success>.

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