Welcome to Math 302, Introduction to Probability!

Instructor: Yaniv Plan
Email: **yaniv@math.ubc.ca (mailto:yaniv@math.ubc.ca,)**

Lectures: T TH F 3:00 – 5:00 pm, W 3:00 – 4:00 pm, in Leonard S. Klinck, room 200. Lectures will also be available in zoom. Students are encouraged to attend in person.

Office hours: W 4:00 – 5:00 pm, F 1:00 – 2:00 pm, in 1219 Math Annex (starting in Week 2).

Textbook: We follow the book "Introduction to Probability" by Anderson, Seppalainen, and Valko. This is a relatively challenging and precise textbook. Each lecture will correspond with subsections of the textbook, see the table below for a tentative schedule.

Other references of interest are R. L. Scheaffer, "Introduction to Probability and its Applications", and S. M. Ross, "A First Course in Probability".

Piazza: This is an online discussion board where you may post questions and look for teammates to help understand the material. This is meant to be a place for students to work together to learn the material. You may ask for help with homework questions, and while hints may be given, solutions should not.

Reading: You should read the corresponding part of the textbook before lecture, keeping an eye out for concepts that you don't understand which can be clarified in lecture. After lecture, you should work out one or two problems from the covered sections to solidify your new knowledge.

Written homework: These will be due each Friday by 10:00 pm after the first week of class. Solutions should be submitted as a single file through canvas. You may write answers by hand and scan or take pictures of your work, or you may type up solutions. There is a 1 hour 59 minute grace period, but any homework submitted late (after 11:59pm on Friday) will not be accepted. The lowest homework score will be dropped.

- **Showing work:** To receive credit on homework, students must show the work they used to arrive at their solutions. How much work should you show? As a rule of thumb, imagine that another Math 302 student is reading your homework but was not able to solve the questions for this assignment. Your solutions should be written with sufficient steps/explanation that this student can understand how you solved the questions after reading your work.
- **Academic integrity:** Students may work together to understand the homework 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. Do not substitute our homework assignments with assignments from previous terms. There will be differences, sometimes subtle, and turning in a solution to an assignment from a previous term would be considered a breach of academic integrity.

Grading scheme:

Homework: 15%

Midterm: 35%

Final: 50%

Week-by-week schedule: (We may get ahead or behind, but plan to cover the following sections in the following order. Depending on time, some sub-sections may be omitted.)

Week	Textbook sections	Notes
July 5-8	1.1-1.5, 2.1-2.4	July 8 is last day to withdraw without W on record
July 12-15	2.5, 3.1-3.5, 4.1	
July 19-22	4.2-4.5, 5.1-5.2, 6.1-6.2	
July 26-29	6.3, 7.1, 8.1-8.2	**Midterm July 27.** July 29 is last day to withdraw (with a W on record)
Aug 2-5	8.3-8.4, 9.1-9.3	
Aug 9-11	10.1-10.3	Aug 11 is last day of classes

Final Exam period: Aug 15-19

Topics covered in class will include:

- Sample spaces, events, axioms of probability;
- counting principles, and combinatorics;
- independence and conditional probability, Bayes formula;
- discrete random variables and their expectation and variance;
- continuous random variables and their expectation and variance;
- join distributions, conditional distributions;
- transformations of random variables;
- covariance and correlation;
- moment generating function;
- Chebyshev inequality;

- law of large numbers and central limit theorem.