Syllabus

Course Goals

- Read and Write statements involving combinatorics and probability (including conditional probability).
- Model situations with appropriate probability tools (including standard random variables).
- Calculate and estimate probabilities using standard tools (including Bayes Theorem, the Central Limit Theorem, and concentration inequalities).
- Understand and use continuous and multivariable probability distributions.
- Gain a basic familiarity with Python.

The Pandemic Reality

We are still in the middle of a health emergency!

The current version of the course has only been offered online and is still undergoing iteration. We intend to stick to this syllabus as closely as possible. If we do make changes, it will always be to your benefit. We may propose changes if there are significant changes to the public health situation.

In return, we ask that you do not suffer in silence. If unforeseen circumstances arise during the quarter, you should let us know. The sooner we are made aware, the more options we will have for designing accommodations.

If you have ideas to improve the course, you can send us anonymous feedback.

Assessments

Your grade consists of Concept Checks (10%), Homeworks (70%), three "Probability in the Real World" mini projects (10%), and a final (10%).

Concept Checks

At the end of each lecture, you will complete a Concept Check on Gradescope. These mini-quizzes are designed to identify any misconceptions, so we recommend that you complete them after each lecture. You will have until 9 a.m. on the Monday following the lecture to complete each quiz.

Concept Checks are autograded and you may submit as many times as you need to get all questions correct. We do not accept late work, but we calculate your grade out of 80%. Additionally, we will drop the lowest 4 concept checks (so that 25 count).

Homeworks

There will be approximately nine homeworks. Most of them are written questions, but in some weeks there will be a programming question.

Homeworks are both a chance for you to improve your understanding and for us to evaluate how well you understand the material. For that reason, although you are encouraged to discuss the problems with one another, you must still write solutions up on your own. More details are included in the Collaboration Policy below.

Mini Projects

There will be three mini projects that deal with the real-world implications of the tools from this class. Unlike homeworks, mini-projects will not focus on practicing new technical concepts. Instead they will ask you to consider how and whether the concepts from this class might be applied in real-life, and use them to gain insight on ethical questions.

Exams

We will have a single take-home final. It will be similar in style to a homework assignment, but cumulative and with different collaboration rules.

More details and practice materials will be announced closer to the exams. We plan to give you at least 24 hours to complete the exam and not use any proctoring tools (e.g., Proctorio.) If you already know you will have a conflict during Finals Week, please let us know early in the quarter.

Academic Integrity

The goal of our exercises is for you to fully understand and internalize the approach to the materials. To that end, we take academic integrity very seriously. We refer violations of departmental policies to the Office of Academic Affairs.

Collaboration

You are allowed (and encouraged!) to discuss homework problems with other students, as long as you:

- Do not take away any notes or screenshots during your discussion.
- Take a 30-minute break before writing up your solution individually.
- Cite the names of all of your collaborators somewhere in your writeup.

Note that concept checks, (which must be completed independently), mini-projects, and the final exam will also have slightly different collaboration rules included in the assignments.

If you are confused as to whether or not some collaboration is allowed, ask us! No set of rules will be completely exhaustive.

If something weird happens, please tell us too! We will not take action if you tell us about it before turning in the assignment.

Scenarios

What happened?	Is it a violation?
When searching for general information, you accidentally find the exact question we asked. You tell the staff, and provide a link to what you found.	**Not a violation!** We'll say thanks for letting us know and make sure you didn't plagiarize. There won't be a penalty but only a warm, fuzzy feeling.
You and a friend separately write up solutions, then compare. Your friend suggests that your conclusion is a little unclear. You formulate a new conclusion on the Zoom call together.	**Violation!** That is no longer your individual writeup.
You and a friend separately write up solutions, then compare. Your friend suggests changing "permutation" to "combination." You wait 30 minutes, then return to your writeup, decide the changes would be improvements, and incorporate them.	**Not a violation!** Minor rewordings done by you at another's suggestion are fine. The writeup is still substantially yours.
You find a textbook with sample solutions to similar problems. You see that they like to introduce variables with "Consider" and use "hence" instead of "because." You copy these words, because they seem cooler.	**Not a violation!** Single words or stock phrases are things you can learn from. It is not a violation to emulate style (but "hence" *is* a little archaic).

After you and a friend separately attempt a problem, you check with a friend to see if your final formulas/numbers are identical	**Not a violation!** But the work that you show must be built up independently.
You share your final formulas/numbers with everyone you know on Discord.	**Violation!** We do not consider this to be collaboration. Sharing final answers does not help anyone learn.

Late Policy

Homeworks

You will have six late days to use during the quarter for homework assignments. A late day allows you to turn in an assignment up to 24 hours later without penalty. Simply submit late and we will keep track of your usage internally.

Regardless of how many late days you have, you cannot submit an assignment more than 72 hours after it is due without prior permission from course staff.

For example, an assignment due at 11:59 PM on Friday could be turned in at 11:58 PM on Monday with no penalty by using three late days. However, you cannot submit once you see 11:59 PM on the clock, as it would have been 72 hours past due.

If you run out of late days, you may still turn in an assignment late, at a penalty of 15% of the assignment's point value per day.

Late days are designed to handle the "normal" difficulties in a quarter (e.g. prioritizing different courses, fundraising for an RSO, or attending a relative's

birthday Zoom call). If your situation goes beyond those “normal” circumstances, you should contact the course staff as early as you can.

Concept Checks

Late work is not accepted, but earning 80% in this category leads to 100% in the grade book.

Exams

You cannot submit the final exam late.

If you have extenuating circumstances that interfere with completing these activities on-time, you should contact the course staff.

Accommodations

If you have, or think you may have, a temporary health condition or permanent disability, contact Disability Resources for Students (DRS) to get started with accommodations.

Accommodations for faith or conscience reasons must be requested within the first two weeks using the Registrar’s request form. The UW’s religious accommodations policy is available here.

Your performance in this course should not be affected by circumstances beyond your control. We can still work with you for situations other than the university-wide accommodations. If anything does come up, you should contact the course staff as early as you can.