MATH 151 Fall 2024 MWF class Syllabus

Prof. Mark Huber

Probability is the branch of mathematics that deals with partial information. In this course we will learn the applications, methods, and theory of probability. This includes the basic definition of probability functions, basic logic, random variables, means, variances, standard deviations, correlation, distributions, densities, and results such as the Strong Law of Large Numbers and the Central Limit Theorem.

Structure

The structure of this course will be a *flipped* class, which will work as follows. At the end of the previous week, two readings and two videos will be posted to the course website. Everyone will watch these videos and read these lessons on their own. Then the Monday and Wednesday class meetings will be question and answer sessions where you can ask about the lectures or about problems on the homework. These will be recorded in case you cannot attend.

On Fridays students will be working through a lab exercise. These labs can be completed either using the computers in the classroom, or on your own laptop. The programming language for these exercises is R. I will not assume that students have any familiarity with R coming into the course.

Student grades will be determined by

- Homework (10%)
- Labs (10%)
- Midterm 1 (20%)
- Midterm 2 (20%)
- Final (40%)

The midterms and finals *must* be taken in the classroom.

Course website

The course website is hosted using Canvas at https://cmc.instructure.com/courses/1762 (https://cmc.instructure.com/courses/1762).

Email

The best way to reach me is through email at autotomic@gmail.com (mailto:autotomic@gmail.com). Please begin your subject line with **MATH 151** (exactly, including the space!) so that I can filter your emails from the spam. While I try to check my email often, there might be delays, and so you should not assume that I will answer your emails immediately. Especially the night before homework or a lab is due you might not get a response until the next morning.

Grades

Grades will be determined using 10% homework, 10% Labs, 20% Midterm #1, 20% Midterm #2, 40% Final.

Homework

There will be assignments due every week of the course except those weeks with midterm exams. Each homework will be posted by Friday and due back by the following Friday.

You are welcome to work together on the assignments, but the final writeups should be your own. In the writeups, indicate your calculations and reasoning for all the work submitted. For numerical answers, draw a box around your answer and use four significant figures for approximation unless the answer is an integer or instructed otherwise in the problem statement.

Each homework will consist of 10 questions, and each question is worth 1 point. Problems vary from easy to difficult, so be sure to look over an assignment to see what you are up against before Tuesday night. You should not assume that late homework will be graded, grading time is limited and late papers have the lowest priority.

Homework instant failure

Failure to turn in 5 or more homeworks in the course on time (except under extraordinary circumstances) will result in an F being given for the course, no matter what your score is on the midterms or final. Even if you can only do one problem half right, turn it in and it will not count against your 5 homeworks.

Homework drop

You will be allowed to drop the lowest score on your homework. This is basically to handle a week for which some external reason prevents you from turning in a homework. Note that for those participating in athletics, academic clubs, or conferences, it is important to start the homework early if you will be gone the day the homework is due. When the homework is launched (the week before) you should have the knowledge to complete it, so please get started early!

Labs

Fridays are designated as lab sessions. These labs are intended to be exercises to work through to build understanding and check that you comprehend the material. Sometimes they will move beyond the material in lecture. These labs are primarily computer based, and so you will want to bring a laptop with you to class on these days.

The product of the lab session will be an .R file that will be uploaded to Gradescope and autograded. That means that you will instantly be given a score. You can then continue to work, fixing problems that are incorrect, and resubmitting as often as you wish before the deadline, which will be Friday at midnight.

The labs will be posted at the beginning of the week for those who wish to get a jump on them.

Like the homework you are welcome to work with other students on the problems. Again, the labs are primarily for your benefit to test your understanding of the material. They are, like the homework, only 10% of your grade.

Midterms

There will be three large midterms, each of which covers about a third of the course.

For the midterm exams, you will be allowed a sheet of paper with whatever you would like to write on it, both sides. For the final, you will be allowed two such sheets of paper. You will also be allowed to use a calculator. You cannot use any other external aids or collaborate with another student in any way, shape, or form.

Dates for these exams are as follows:

Exam	Date
Midterm 1	Oct. 4
Midterm 2	Nov. 8
Final	Dec. 13

Office hours

I will be holding daily office hours for one hour in the afternoon Monday through Thursday from 2:50-3:50 using Zoom https://cmc-its.zoom.us/j/155961110 (https://cmc-its.zoom.us/j/155961110). If you wish to meet in person, or cannot make these times please let me know and I will schedule a separate time to meet.

Breaks during lecture

If you find you need to take a break and leave class temporarily, please do! You do not need to ask permission to leave a lecture.

Time and Place

The class meets Monday, Wednesday, and Friday at 10:00-10:50 in room Kravis 165 on the CMC campus.

A word about AI

The term *AI* includes a variety of computerized tools, starting with spelling and grammar checkers, and working up to tools for solving math problems.

You are free to use any and all computer tools and websites in doing your homework and labs. However, I would suggest that you try to reserve this for a last resort! On the exams and the finals it will be just you, your calculator, and your notesheet, and not knowing how to apply the conditional probability formula because Gemini did it for you on the homework will leave you with a sinking feeling in the pit of your stomach when faced with the same question on an exam. You will not enjoy this feeling in the slightest.

Of course, the same applies to working with other people during the course: you are free to do this, but please make sure that it is a collaborative effort, by which I mean that you are understanding what is going on with a problem solution. If you don't understand the problem, if you cannot find the solution to a different problem after doing the homework, this is going to end up badly for you on the exams.

Course Plan

First a reminder: this course is partially flipped, which means that you are responsible for watching the videos/reading the chapters of the text *before* the lecture begin. The class periods are for you to

1. Ask questions about the material.
2. Work through problems similar to those on the homework.
3. Generally make sure that you are up to date on the course.

So the course plan is broken down by week rather than by period. Monday and Wednesday of each week will be devoted to open sessions for questions, while Friday will concentrate on the lab being given about that week.

Note that the YouTube video is named Probability Adventures #N, where N is the number of the chapter in the text.

Week	Date	Chapters	Notes
1	Aug 26 - Aug 30	1 - 2	
2	Sep 2 - Sep 6	3 - 4	No Class on Monday, Labor Day!
3	Sep 7 - Sep 13	5 - 6	
4	Sep 16 - Sep 20	7 - 8	
5	Sep 23 - Sep 27	9 - 10	No in class lecture this week!
6	Sep 30 - Oct 4	Review and Midterm #1	
7	Oct 7 - Oct 11	11 - 12	
8	Oct 14 - Oct 18	13 - 14	No Class on Monday, Fall Break!
9	Oct 21 - Oct 25	15 - 16	
10	Oct 28 - Nov 1	17 - 18	
11	Nov 4 - Nov 8	Review and Midterm #2	
12	Nov 11 - Nov 15	19 - 20	
13	Nov 18 - Nov 22	21 - 22	
14	Nov 25 - Nov 29	None!	No in class lecture this week! (Thanksgiving)
15	Dec 2 - Dec 6	23 - 24	
16	Dec 9 - Dec 13	Final	Dec 13, 9:00, in same room as class.