# MATH 5010: Introduction to Probability

## Summer 2019

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| **Instructor:** | Curtis Miller | **Time:** | TH 5:30 – 7:00 |
| **Email:** | cmiller@math.utah.edu | **Place:** | AEB 320 |

**Office Hours:** By appointment, JWB 121 in my cubicle

**Required Materials:**

- David F. Anderson, Timo Seppäläinen, and Benedek Valkó, *Introduction to Probability*, Cambridge University Press, 2018

**Objectives:** This course is an introduction to probability theory. We will discuss probability measures, conditional probability and independence, random variables, expectations, joint distributions, the behavior of sums of random variables, and limit theorems.

**Prerequisites:** Students must have passed MATH 2210 (Calculus III) or an equivalent with a "C" grade or better.

**Tentative Course Outline:** In this course, we will cover chapters 1 through 10 of Anderson et. al.'s book. This will cover:

- Random experiments
- Probability spaces
- Random variables
- Conditional probability and independence
- Probabilistic transformations
- Joint distributions of random variables
- Sums of random variables
- Expected values
- Limit theorems
- Conditional distributions

**Grading Policy:** Below describes how the final grade for MATH 5010 will be computed:

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\begin{aligned}
&\text{Homework } \ldots\ldots\ldots\ldots\ldots 15\% \\
&\text{Quizzes } \ldots\ldots\ldots\ldots\ldots\ldots 15\% \\
&\text{First Midterm } \ldots\ldots\ldots\ldots 20\% \\
&\text{Second Midterm } \ldots\ldots\ldots\ldots 20\% \\
&\text{Final Exam } \ldots\ldots\ldots\ldots\ldots 30\%
\end{aligned}
$$

Final grades will be assigned according to the following:

A ....................... +93%
A- .................... 90–92%
B+ ................... 87–89%
B ..................... 83–86%
B- ................... 80–82%
C+ .................. 77–79%
C ..................... 73–76%
C- ................... 70–72%
D+ .................. 67–69%
D ................... 63–66%
D- .................. 60–62%
E ..................... 0–59%

Do not expect a curve to be applied.

**Important Dates:**

First Midterm ................ Thursday, June 13, 2019
Second Midterm ............... Thursday, July 11, 2019
Final Exam ..................................... TBD

**Makeups:** There will be no makeup exams, homework or quizzes under any circumstances. If you are unable to meet a deadline or attend an exam, I may make accommodations if I am notified prior to the due date or exam date in question. Decisions are made on a case-by-case basis.

**Homework:** Homework problems are assigned in class every Tuesday and are due the same day the following week. Each homework assignment has an equal contribution to your overall grade. Late homework will not be accepted. Assignments may be hand-written or typed. In order for you to receive credit for problems, you need to show your work.

**Quizzes:** Quizzes take place roughly every Thursday (except when a midterm exam is scheduled) in class and last 15 minutes. Quizzes cannot be taken at a different time for any reason unless previously arranged with me. Each quiz has an equal contribution to your overall grade.

**Midterms:** There will be two midterms. Midterms are not cumulative (in the sense that they cover material that was covered in a previous exam). The content of midterms roughly correspond to the material discussed in class between midterms. The first midterm will be given **June 13, 2019**. The second midterm will be given **July 11, 2019**. Partial credit on problems will be given, so be clear about the steps you took. Show your work.

**Final:** The date and time of the final exam are **TBD**. The final exam will be cumulative. Partial credit on problems will be given, so be clear about the steps you took. Show your work.

**Test Conduct:** I will tolerate no talking during tests. All unapproved electronic devices must be silenced and put away out of sight. If I see or hear an unapproved electronic device, I may confiscate it and hold it until you leave the test. You cannot use unapproved books or printouts (at least not without consulting me). After you turn in your test, you may not pick it up again; submission is final.

**Cheating:** Anyone caught cheating will be given a failing grade in the course and reported to the proper University of Utah authorities for further penalization. There will be zero tolerance for cheating. Cheating includes (but is not limited to):

- Use of any improper electronic device (including cell phones and calculators with unacceptable features) or materials during a test

- Violation of test conduct

- Trying to look at your neighbor's work during a test

- Plagiarism (duplication of someone else's work without giving proper credit)

- Verbatim duplication of someone else's assignment (you are permitted to work together, but producing an exact duplicate of someone else's assignment is unacceptable; note that facilitating duplication, such as giving your homework to a student so he can copy your work, also counts as cheating even though you yourself are not using it to boost your grade)

- Not completing your work yourself (such as having someone else take your test)

**Class Conduct:** During normal class, I want all electronic devices silenced, though I will allow such devices to be used. Technology is an essential part of modern statistics so you may use technology in class so long as you are participating in the class. You are encouraged to bring a calculator; you will need it. I want you to participate in class, but please do not engage in side conversations; I find them distracting. Snacks or soft drinks are permitted in class so long as they are not distracting. You are expected to be polite and conduct yourself in a professional manner. You should show me and your fellow students respect. Disruptive behavior (including violation of any of my requests mentioned above) will not be tolerated and may result in expulsion from the classroom.

**ADA Statement:** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and me to make arrangements for accommodations. Other Policies: All University of Utah policies are in force, including the student code and dress standards. If you are an athlete, provide me all the proper documentation for any accommodations you need as soon as possible.

Students needing accommodation for University of Utah sanctioned events (such as athletics) need to give me the appropriate documentation at the beginning of the semester. If I do not receive this documentation, I am not obligated to accommodate you.

I reserve the right to make changes to this syllabus for any reason at any time. I will notify you via e-mail or Canvas when those changes are made. You are responsible for reading my messages.

**Additional Resources:** If you need assistance, I recommend you first go to the University of Utah Math Center (underground connecting JWB and LCB buildings) and the Tutoring Center located there. Sometimes they have statistics tutors there (check their tutor schedule) and they can provide free tutoring when available. There is a computer lab in the Math Center where tutoring takes place if you need access to a computer. You may also request a tutor from ASUU's tutoring services by visiting their office in SSB. There are online resources such as Khan Academy you may use as well. (I have compiled useful links at http://math.utah.edu/~cmiller/other.html.) If you need to see me, visit me during my office hours or e-mail me and schedule an appointment.