

# Math 461 - Introduction to Statistical Methods I

## Instructor

Prof. David Levin  
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Office hours: MW 10-10:50

## Course Time and Location

MWF 9:00am - 9:50am [Anstett\\_Hall\\_195](#)

## Textbook

A First Course in Probability, current Edition, Sheldon Ross

## Course Objectives

- Calculate probabilities using the rules of probability, including the law of total probability and Bayes' Rule.
- Calculate probabilities using elementary combinatorics.
- Calculate probabilities for continuous random variables via integration.
- Calculate distributions of random variables formed from elementary combinations of other random variables. In particular, the sum of two independent random variables via the convolution formula.
- Calculate with standard probability distributions: Discrete: Bernoulli, Binomial, Poisson, Geometric; Continuous: Normal, exponential, uniform, Gamma.
- Calculate expectations and variances, and use moment inequalities to approximate probabilities.
- Calculate limits in probability and limits in distribution.
- Use the central limit theorem to approximate probabilities; use the Poisson approximation.

## Notes to instructor:

- Do not get bogged down in combinatorics. Some students struggle with this material, and if you spend too much time on it, you will not get to more important topics.
- The real challenge is the material which requires integrating over non-square regions in the plane. Students have not taken multivariate calculus, and even if they have, they are not good at determining appropriate regions. Stick to easy examples, like the uniform distribution, where probability is the same as area.
- Students need to distinguish between random variables, usually denoted by capital letters, like X,Y,Z, and a value of a random variable, denoted usually by lower-case letters, x,y,z. The latter is the variable of integration in the continuous case. This is a cause of confusion for many students.
- It is important to get to the weak law of large numbers and the Central Limit Theorem. Do not spend too much time on combinatorics or multivariate integration or you will not get to these important tools.

## Grading (guidelines)

Homework 13%  
Class Participation 2%  
Quizzes 10%  
Midterm I 22%  
Midterm II 22%  
Final 31%

## Homework

Homework should be submitted electronically to Canvas. You need to upload ONE PDF file with your solution directly to Canvas. If you cannot prepare a typeset version, you may scan a handwritten solution. Make sure the file is not larger than 5MB. Caution: cellphone images are rarely readable and usually too large, and are not acceptable. Note that graduate students (561) are required to type their homework. Typing is slower, but it forces you to check your work often, resulting in fewer mistakes.

Homework which is illegible or otherwise incomprehensible may not receive credit. Correct answers alone are insufficient for full credit. A clear and coherent derivation showing all work must be included. Answers should be worked out in advance on scrap paper, and then written up nicely to be turned in. I am well aware that answers may be available from various sources; turning in answers which you simply copy from another source is considered cheating and treated accordingly.

## LaTeX:

A very good way to type math is to use LaTeX, but there is a learning curve associated with it. If you are willing to try I can help you start the learning process. Install MikTeX under Windows, MacTeX on Mac. MacTeX already has a nice TexShop editor, under Windows you can install TexnicCenter. There are many online LaTeX manuals, in particular: <https://en.wikibooks.org/wiki/LaTeX>.

Homework will be posted before Thursday at 5pm and will be due the following Friday by 5 pm, unless specifically noted.

## Quizzes

There will be weekly quizzes, on Fridays (unless specified otherwise). The lowest quiz score will be dropped.

## Learning Environment

The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or [uaec@uoregon.edu](mailto:uaec@uoregon.edu).

## Academic Conduct

The code of student conduct and community standards is at [conduct.uoregon.edu](http://conduct.uoregon.edu). In this course, it is appropriate to help each other on homework as long as the work you are submitting is your own and you understand it. It is not appropriate to help each other on exams, to look at other students exams, or to bring unauthorized material to exams.

## Email

Because I have a filter set on my incoming email, email will only be received if it conforms to the following guidelines. I will make an effort to return email which satisfies these requirements within 24 hours.

- It must come from your official uoregon.edu email address
- Title line must say MATH 461
- Your email must open as follows, where you replace <<your name>> with your name as it appears with the UO registrar:  
Dear Professor Levin,  
I am <<your name>> enrolled in Math 461.

## Final Exam

The following is University policy concerning final exams:

*Final examinations must be given during the scheduled final examination period. Faculty legislation prohibits the early administration of final examinations. Final examination week is considered to be a part of the regular term, and to end the term prior to its scheduled date reduces instructional days to which students are entitled.*

Therefore, requests to take the final at a time different from the scheduled time will not be granted.

## Class Participation

Class attendance and participation is mandatory. Class participation accounts for 2% of the final grade.

## Class policies:

- Computers, phones, tablets or other electronic devices are not permitted in class, unless explicitly stated otherwise.
- Arrive before class begins and exit only after class is dismissed. It is distracting to have students entering and exiting, so plan accordingly. If you cannot attend for the full length of the class, do not come at all.
- The lowest homework score will be dropped. Late homework will not be accepted under any circumstances.
- Requests to take scheduled exams at other times will not be granted.
- You are responsible for any announcements, such as changes to due dates, which are made on Canvas.

## Approximate Schedule

Week 1	Chapter 1	Week 6	Chapter 5
Week 2	Chapter 2	Week 7	Chapter 6
Week 3	Chapter 3	Week 8	Chapter 7
Week 4	Chapter 4	Week 9	(midterm) Chapter 8
Week 5	(midterm) Chapter 5	Week 10	Catch-up