

# STAT 1151: Introduction to Probability

MWF 1 – 1:50 pm in 1501 Wesley W. Posvar Hall

	Name	Email	Office Hours
<b>Instructor</b>	Kiran Nihlani	<a href="mailto:kiran.nihlani@pitt.edu">kiran.nihlani@pitt.edu</a>	See Canvas Page
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## Course Summary

This course presents, at both a theoretical and applied level, the basic probability concepts required for statistical inference. The concepts to be discussed include the following: set theory and basic probability; independence and Bayes' Theorem; discrete random variables and their distributions, (e.g., Bernoulli, binomial, Poisson, and geometric); continuous random variables and their distributions, (e.g., uniform, exponential, gamma, beta, and normal); transformations of random variables; moments and moment generating functions; multivariate discrete distributions; marginal and conditional distributions; independent random variables; functions of random variables.

Note: The material in this course is naturally cumulative in nature. It is a rigorous introduction to probability that relies heavily on calculus and can get tedious at times. Thus, it is important to not fall behind in your reading or assignments, or you will find yourself lost.

## Prerequisite

Two terms of Calculus (e.g. MATH 0220 and 0230)

Note: Please contact the instructor if you haven't successfully completed these courses or are taking/retaking them this semester.

## Learning Resources, Technology & Texts

- **Required Textbook:** Miller, I. and M. Miller, John E. Freund's Mathematical Statistics, 8th edn., Pearson Education, Inc., 2014 or 2019.
  - If purchasing the text, avoid the “International Edition”.
  - Two physical copies of the book are available through the Course Reserves at the library.
  - An online course reserve has also been setup for the first 3 chapters of the text. Check the Canvas page for more details.
  - It is easy to find easily downloadable “PDF” versions with a quick internet search. Some of these are from earlier editions and/or international editions with edited front cover. Be careful when using these since they do not include all exercise problems. Check exercise pages starting chapter 4 to ensure completeness.
  - I use the same textbook STAT 1152 as well in case you are planning on taking that course.
- **Canvas:** You can access the course via Canvas. It is strongly suggested that you explore and become familiar not only with the site navigation, but with content and resources available for this course.
- **Lectures:** Lectures will be delivered in person only. **No recordings will be made available for any reason and there is no option to attend virtually.**
- **Lecture Material:** The material for this class will be broken down into 7 topics. An incomplete version of the slides will be posted on Canvas before the lecture for you to fill along in class. Completed slides will be posted **once the entire deck of slides is completed in class**. The slides by themselves will not be enough and need to be supported by reading the textbook.
- **Gradescope:** Gradescope will be used to turn in assignments for this class. Refer to the Canvas page for detailed Gradescope submission guidelines.

## Communications

All electronic communications will be handled through the Pitt e-mail system or Canvas messaging. Course-related emails should be primarily for administrative purposes, not explaining material, or receiving help on assignment problems. Students are expected to check their email and the course website regularly for announcements and materials. The average response times for emails/messages is **2 business days**. Emails may not receive a reply over weekends and after 5 pm on weekdays.

In order for me to streamline the emails, the subject line for your email/message on Canvas should begin with **“STAT 1151 Section 1070/12 pm” or “STAT 1151 Section 1060/1 pm”** to identify your section number. Emails without this information may get a delayed response.

## Assessments

- **Homework.** There will be 8-9 homework assignments throughout the semester. Not all homework assignments are weighted equally. You will have (roughly) a week to turn in the homework.

### Rules:

- All assignments should be your individual work; otherwise, points will be deducted.
- Your assignment should be **handwritten**, neat and well-organized.
- Show all your work to receive full credit, and circle your answer so it's easy to locate. Your TA is a student like you and will not take time to decipher poor handwriting, put pages in order, or read notes scrawled in the margins.
- **Your work will be graded for accuracy and not just completion.**
- You will use Gradescope to turn in all your assignments. Submissions made on Gradescope are considered final. It is your responsibility to make sure your submission has gone through completely and accurately. Technological issues will not be considered for an extension or late submission.
  - \* If we aren't able to see/open your submission on Gradescope, it will be treated as a no submission.
  - \* Refer to Gradescope guidelines on Canvas for more information.
- **Exams.** There will be two midterm exams during the semester and a cumulative final exam. The exam will be a mix of multiple choice and short answer questions. Exams will be conducted in class. You will be able to use a “real” calculator (not the one on your cell phone) and an equation sheet. Details on the equation sheet are available on Canvas.

Note: Exams must be completed in-person and no virtual exam option will be provided for any reason.

## Late Submission Policy

Due date for every homework assignment will be provided on the course schedule posted on Canvas. Unless otherwise stated, assignments are due on those days.

However, I recognize that sometimes “life happens.” In these instances, you may use your allotted **two** grace days throughout the semester. These days allow you to submit an assignment up to two days late or two assignments one day late without penalty. You can use these days for any assignment and for any reason. You do not need to provide me with the reason: simply email the TA and COPY ME on that email and tell us how many of your grace days you would like to use. The days are used as a whole and cannot be broken down. **Grace days will automatically be used if you don't email and let us know otherwise.**

Once you've exhausted your grace days, point deductions will occur for any assignment submitted after the deadline. An assignment submitted within 24 hours of the due date will be graded at most on a 50% scale. **Assignments submitted more than 24 hours after the due date will not be accepted for any reason.**

Solutions to assignments will be posted routinely. No submissions will be accepted once the solutions have been posted.

### Exam Make-up Policy

All exams are required and there will be no make-up exams. Missed exams will receive a grade of zero.

### Grading Policy

Point values for assignments and exams are given in the table below. If you feel an error has been made in grading one of your assignments, return the assignment to the instructor with a written explanation of the error, and the entire assignment will be re-graded. Re-grade requests should be submitted within one week of the graded assignment being returned to you. Although errors in recording grades are rare, mistakes can happen, therefore it will be important that you keep your graded assignments. This will allow mistakes to be corrected before the final grade is assigned.

Assessment	Points
Homework	30%
Midterm 1	20%
Midterm 2	20%
Final	30%

**Note: 10/24/2025 is the last day to withdraw from the course and receive a “W” grade (monitored withdrawal through Dean’s office).**

### Attendance Policy

There is no enforced attendance policy in this class. You are expected to be on time and respectful of the instructor and other students. **Office hours cannot be used to compensate for habitual absenteeism.** You can expect your instructor to be courteous, punctual, well-organized, prepared for lecture, available during office hours, and to grade uniformly.

### Classroom Courtesy

Please refrain from use of cell phones or other handheld devices during class time. Repeat offenders may have their participation grade reduced, since it is a clear distraction from the class material. Use of laptops and tablets for class-related material is fine, but please refrain from any use or activity that will distract you or your fellow students.

### Office Hour Etiquette

Office hours will be held by the instructor and/or the TA to seek help or clarification regarding the course material. To make the most of these office hours:

- Read your textbook, review lecture notes thoroughly, and attempt the assigned problems **before** you go to office hours.
- Try to identify specific questions or concepts you need to address during the office hours.
- The instructor/TA will ask you questions to assess your understanding to help you better.
- Be patient! There may be several students at a given time.
- Avoid waiting until the day before the test or the day before an assignment is due to seek assistance. **It is easier to keep up than to catch up!**

### How to Succeed in this Course

1. **Repetition.** We learn through repetition. Pre-reading is practice for lecture; lecture is practice for homework; and homework is practice for exams. Therefore, by the time you take exams, you should have experienced the material at least three different ways. But, if you weaken the chain by not reading ahead, by skipping lecture, or by copying someone else’s homework, your exam scores will reflect the weakness.

2. **Homework.** You would not expect to build your muscles by watching someone else lift weights. Similarly, just being able to follow when someone else does the math on the board does not afford you the training to solve the problem when faced with a blank sheet of paper. Expertise is a two-step process: Conceptual understanding is the necessary first step, but that must be followed by the actual doing.
3. **Study Groups.** Although many aspects of learning are necessarily solitary, a University should be a vibrant community of people interacting. You are encouraged to get together in groups to discuss the course topics and homework. This gives you the advantages of:
  - (a) Forcing you to look at the exercises before the last minute;
  - (b) Seeing the material in different ways; and
  - (c) Simply making learning more fun.
4. **Honesty.** You should understand that the only way to succeed is to do the above 3 things honestly and diligently. It is often easy to overestimate your preparedness and comfort with the content based on HW grades. **High scores on HW do not necessarily translate to high scores on exams.**

### Tentative Course Schedule

Date	Topics	Required Reading	Notes
08/25 - 09/03	Introduction, Counting methods, Permutations, Combinations	Chapter 1	
09/03 - 09/10	Basic Probability, Probability Rules, Conditional Probability, Independence	Chapter 2	
09/10 - 09/15	Independence, Bayes' Theorem	Chapter 2	
09/17 - 09/24	Random Variables, Probability distributions and densities	Chapter 3	
09/26 - 10/06	Multivariate, marginal, and conditional distributions	Chapter 3	Midterm 1 (10/01)
10/06 - 10/13	Expectation, Moments and Moment Generating Functions	Chapter 4	10/10: No class - Fall break
10/13 - 10/15	Variance and Covariance	Chapter 4	
10/15 - 10/24	Named Probability Distributions	Chapter 5	10/24: Late Withdrawal Deadline
10/27 - 11/14	Named Probability Densities	Chapter 6	Midterm 2 (11/12)
11/14 - 12/05	Functions of Random Variables, Cumulative Distribution Function Technique, Transformation Technique	Chapter 7	11/24 - 11/28: No class - Thanksgiving break

### Academic Integrity

Students in this course will be expected to comply with the [University of Pittsburgh's Policy on Academic Integrity](#). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

To learn more about Academic Integrity, visit the [Academic Integrity Guide](#) for an overview of the topic. For hands-on practice, complete the [Understanding and Avoiding Plagiarism tutorial](#).

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**Statement on Classroom Recording**

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

**Disability Services**

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and [Disability Resources and Services \(DRS\)](#), 140 William Pitt Union, (412) 648-7890, [drsrecep@pitt.edu](mailto:drsrecep@pitt.edu), (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

**Take Care of Yourself**

Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep, and taking time to relax. Despite what you might hear, using your time to take care of yourself will actually help you achieve your academic goals more than spending too much time studying. All of us benefit from support and guidance during times of struggle. There are many helpful resources available at Pitt. An important part of the college experience is learning how to ask for help. Take the time to learn about all that's available and take advantage of it. You are encouraged to visit [Thrive@Pitt](#) to learn more about well-being and the many campus resources available to help you thrive.

The [University Counseling Center](#) is also here for you. You can call 412-648-7930 at any time to connect with a clinician. If you or someone you know is feeling suicidal, please call the University Counseling Center at any time at 412-648-7930. You can also contact Resolve Crisis Network at 888-796-8226. If the situation is life threatening, call Pitt Police at 412-624-2121 or dial 911.

**One Final Note**

I reserve the right to change my policies stated in this syllabus at any point in the semester. If I do make a change to a policy, I will announce it in class and post the change in an announcement on Canvas.