Math 451/551: Probability – Mathematical Statistics I

Spring, 2018

TR 3:30–4:50 Jones 306

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Office hours: 2:00 PM—3:15 PM EST (Jones 116) or by appt.

Prerequisites: Multivariate calculus, linear algebra, mathematical foundations.

Purpose:

Calculus-based probability is introduced, which includes basic probability concepts and real-world modeling applications. This class provides the background necessary for taking Exam P with the Society of Actuaries (see https://www.soa.org/member).

Text: Leemis, L.M., *Probability*, Second Edition, 2018, Lightning Source.

Grades:

Course grades will be determined by the weights:

Homework	30%
Midterm 1	20%
Midterm 2	20%
Final exam	30%

with a grading scale (plus and minus grades may be assigned within each range):

90 — 100%	A
80 — 90%	B
70 — 80%	C
60 — 70%	D
0 — 60%	F

Course outline (this course will cover the first seven chapters):

1. Introduction
2. Probability
3. Random Variables
4. Common Discrete Distributions
5. Common Continuous Distributions
6. Joint Distributions
7. Functions of Random Variables
8. Limit Theorems

Before the first class meeting:

1. Purchase the textbook at the William & Mary bookstore or on https://www.amazon.com. Please make sure to get the second edition.

2. Print the class notes (150 pages) at http://www.math.wm.edu/~leemis/ch-2x2.pdf. It is fine to print these two sided, perhaps calendar style, to reduce them to 75 pages. These will be the notes that you will fill in during lecture.

3. Download the current version of the R software onto your laptop or desktop machine from http://www.r-project.org.

Learning probability in this online offering:

1. **Attend every class**. Lectures are designed to be the entry point into the material. Make sure to bring your printout of the class notes to each class.

2. **Read the book**. This is a level up from the lectures. Do *not* skip this step and go directly to working homework problems. There are more details in the book and also there are additional examples that will reinforce the material.

3. **Solve the homework exercises**. This is the next level up from the textbook material in that you are now solving probability problems on your own from scratch. The following "empty hands" policy applies to working the homework problems. You may collaborate (and are encouraged to collaborate) with classmates concerning the homework problems. However, you must *remember* (that is, nothing written down) the insights gained by the collaboration, and do the write up to the homework on your own.

4. **Study for the midterm and final exams**. This is another level up from the homework because now problems need to be solved within a fixed time period.

5. (Optional) **Take Exam P**. If you are interested in taking Exam P (the P is for probability), then join a study group on campus and schedule a sitting for the exam. This will require you to take practice exams and complete Chapter 8 in the text on your own.

Homework:

All homework assignments are due at the beginning of the class period one week after they are assigned. No late assignments will be accepted without prior approval from the instructor. Legitimate excuses for a late homework assignment include illness and a death in the family. Please show all of your work when solving the problems and box your final answers. Showing your work is necessary for me to grade your homework, but it is also important for the future you as you study for the exams.