MATH 371: Probability

MWF 2:15 – 3:15
Chapman 106
https://eallman.github.io/classes/371/371_2017.html

Instructor: Elizabeth S. Allman, Chapman 308B, e.allman@alaska.edu and 474-2479.

Office Hours: M 3:15, T 8:30, W 1:00, and by appointment. These office hours may change at a later date, depending on student demand and scheduling concerns. Please note that the best way to reach me is by e-mail.

Textbook: Wackerly, Mendenhall, Scheaffer *Mathematical Statistics with Applications*, seventh edition. A students solutions manual is also available in the bookstore or online.

Grading: There will be two midterms and a cumulative final exam in Probability. In addition, there will be weekly homework assignments and R labs. Grades will be assigned using the following weights:

Homework and Labs	20 %
Midterm (25 each ×2)	50 %
Final Exam	30 %

The midterms are tentatively scheduled for Wednesday, October 4 and Wednesday, November 8. The cumulative final exam will take place as published in the schedule of courses, on Wednesday, December 13 from 1:00 – 3:00. Makeup exams will not be given.

Content: 'Probability theory began in seventeenth century France when the two great French mathematicians, Blaise Pascal and Pierre de Fermat, corresponded over two problems from games of chance.' Probability is still associated with games of chance, though now it is more broadly associated with trying to quantify one's belief in the occurrence of a future event. If you make five baskets in a row from the free-throw line, how likely do you think it is that you will make the next shot? If you toss a coin and get five heads in a row, would you be willing to bet that you'll get a head on the next toss?

In this course we'll study the basics of probability theory. In particular, we'll study descriptive statistics, counting principles, laws of probability, discrete and continuous random variables, probability distributions, sampling distributions, and the Central Limit Theorem. This corresponds to chapters 1 - 7 in the textbook.

It is wise to think of this course as the first course of a year long sequence, MATH 371 followed by MATH 408 Statistics. This semester you learn how things might work in an ideal world (random variables, density functions, distributions). Later you learn how to estimate quantities of interest using the probabilistic models we developed.

Using statistical software packages is an important skill that every student learning about probability and statistics should acquire. In this class we will use the free statistical package R and you should download RStudio to your personal computer, or expect to use a campus one with R installed.

Course Outline: Probability is a three hour course, and class meetings will primarily be in lecture format. I encourage you to ask questions and participate actively in class. Questions on homework and R labs should be asked during office hours.

Homework will be assigned weekly on the class webpage and collected about once a week at the beginning of class on Wednesdays. You should get into the habit of checking this page regularly. Class announcements and other useful information will be posted there too.

I recommend that you purchase the student solutions manual that accompanies the textbook, and use this as a gauge of your understanding. Feel free to work with other students on your homework, but your homework should reflect your understanding of the material. Individual problems on collected homework assignments will not be graded; instead each student will earn a score on a 0-1-2 scale reflecting my impression of the completeness of the assignment.

A second component of your homework grade will be `R` labs, designed so that you gain some facility using a real statistics package and perform some calculations that you could not do by hand. These will be graded by your instructor. Late homeworks, both book problems and `R` labs, will not be accepted.

The Math Lab, located in Chapman 305, is an excellent place for study groups to gather. Tutors are available there, and help is close by. Hours for the semester are usually posted by the end of the first full week of classes.

For a tentative schedule of topics and midterm dates, check the last page of this syllabus. Mark your datebooks now with the time for our final exam: Wednesday, December 13, 1:00 – 3:00. Students must take the final exam at the scheduled time.

Finally, please remember to bring your textbook and a *non-smart* calculator to class with you.

Other Policies:

Course accommodations: If you need course adaptations or accommodations because of a disability, please inform your instructor during the first week of the semester, after consulting with the Office of Disability Services, 203 Whitaker (474-7403).

University and Department Policies: Your work in this course is governed by the UAF Honor Code. The Department of Mathematics and Statistics has specific policies on incompletes, late withdrawals, and early final exams, some of which are listed below. A complete listing can be found at

> http://www.dms.uaf.edu/dms/Policies.html.

Prerequisites: The prerequisite for MATH 371 is MATH 202 with a grade of C or better. Students not meeting this prerequisite are not eligible to take this course and will be dropped.

Late Withdrawal: This semester the last day for withdrawing with a 'W' appearing on your transcript is November 3. If, in my opinion, a student is not participating adequately in the class, I may elect to drop this student.

Graded Coursework: Please keep all graded work for MATH 371 until final grades have been assigned.

Academic Honesty: Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.

Grade Bands: A, A- (90 - 100%), B+,B, B- (80 - 89%), C+, C, C- (70 - 79%), D+, D, D- (60 - 69%), F (0 - 59%). On rare occasion, I may lower the thresholds. Also, in an effort to reward the student who makes significant improvement over the course of the term, a stellar grade on the final may overcome a deficiency on the midterm and improve a student's final grade.

Courtesies: As a courtesy to your instructor and fellow students, please arrive to class on time, turn your cell phones and iPods off during class, and pay attention in class.

Tentative Schedule

	Dates	Content	Comments
Week 1	Aug 28, 30, Sept 1	Chapter 1, 2	
Week 2	Sept 6, 8	Chapter 2	M Labor Day holiday
Week 3	Sept 11, 13, 15	Chapter 2	
Week 4	Sept 18, 20, 22	Chapter 3	
Week 5	Sept 25, 27, 29	Chapter 3	
Week 6	Oct 2, 4, 6	Chapter 3, 4	**Exam 1**, W Oct 4
Week 7	Oct 9, 11, 13	Chapter 4	
Week 8	Oct 16, 18, 20	Chapter 4	
Week 9	Oct 23, 25, 27	Chapter 5	
Week 10	Oct 30, Nov 1, 3	Chapter 5	Nov 3 last day to withdraw without a W
Week 11	Nov 6, 8, 10	Chapter 5	**Exam 2**, W Nov 8
Week 12	Nov 13, 15, 17	Chapter 6	
Week 13	Nov 20, 22	Chapter 6	Thanksgiving break
Week 14	Nov 27, 29, Dec 1	Chapter 7	
Week 15	Dec 4, 6, 8	Chapter 7	
Final Exam	W Dec 13, 1-3 pm		Happy Holidays!