

**Math 314 Fall 2018**  
**Probability and Statistics**

**Instructor:** Dr. Kathy Temple

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**Office Hours:** MW 1 - 1:50 PM, TTh 10 - 10:50AM, and by appointment.

**Course Goals:** This course is a calculus-based introduction to probability and statistics. At the end of the course, you will be able to:

- Apply the basic rules of probability to calculate probabilities.
- Calculate probabilities and moments for continuous (calculus here!) and discrete distributions.
- Use sampling distributions and limit theorems to calculate probabilities for sample means and proportions.
- Apply confidence intervals, hypothesis tests, and other statistical tools to real data sets.
- Choose the appropriate statistical tool for a given situation.
- State statistical problems and results clearly and correctly (yes, this means writing!).

**Required Text:** *Exploring the Practice of Statistics*, Moore, McCabe, and Craig; Freeman. Any version of this text is fine. In addition, we will be using sections of *Miller & Freund's Probability and Statistics for Engineers* for some of the calculus-based material; I will provide those sections.

**Sections Covered:** The following is a list of sections we will cover, in the order I expect to cover them in. I have abbreviated *Exploring the Practice of Statistics* as EPS below, and *Probability and Statistics for Engineers* as PSE.

- EPS 3.1, 3.1 (One-variable descriptive statistics).
- EPS 4.1, 4.2, 4.3, and 4.4 (Two-variable descriptive statistics and regression).
- PSE 3.1, 3.3, 3.4, 3.5, and a bit of 3.6 (Basics of probability).
- PSE 4.1, 4.2, 4.4, and some of 4.6 and 4.8 (Discrete random variables and some special families).
- PSE 5.1, 5.2, 5.5, and 5.7 (Continuous random variables and some special families).
- EPS 5.4 (some of) (Rules for means and variances).
- EPS 6.1 and 6.2 (Introduction to statistical inference and sampling distributions; sampling distributions and inference for one and two population proportions).
- EPS 7.1 and 7.2 (Sampling distributions and inference for one and two population means).
- EPS Chapter 8 - selected topics.
- EPS Chapter 9 - selected topics.

**Calculator:** You will need a calculator that performs at least the standard scientific functions.

**Evaluation and Grading:** Grades will consist of the following components: weekly lab write-ups (25%), homework assignments (20%), two midterm exams (15% each), and a comprehensive final exam *or* final project (25%). Tentative exam dates are Wednesday, Oct. 17, and Wednesday, Nov. 14. The final exam will be given on Wednesday, Dec. 5, from 8 - 10AM for the 9AM section and Friday, December 7 from 12-2PM for the noon section. You will have the option of replacing the final exam with a final project; more information will be provided on that later. Grades will be assigned according to the following scale:

		A	100-93%	A-	92.99-90%
B+	89.99-87%	B	86.99-83%	B-	82.99-80%
C+	79.99-77%	C	76.99-73%	C-	72.99-70%
D+	69.99-67%	D	66.99-63%	D-	62.99-60%
		F	59.99%		and below

**General Course Policies:** Daily attendance is expected and considered necessary for success. It is your responsibility to find out what was covered on days you were absent. Please bring your calculator to each class meeting. You are responsible for any announcements made in class regarding homework, exams, and labs. Handouts from class and homework assignments will be posted on Canvas. Please note that Wednesdays are “lab days” where class will meet in the computer lab. You will have activities to do on these days using statistical software and write-ups based on these to submit; see below.

All work handed in for the course must be written neatly, legibly, clearly, using correct mathematical notation, and with sufficient explanation. A good rule of thumb is to write your solution so that a classmate who knows roughly what’s going on in the course but doesn’t know how to do this particular problem can understand your solution. As a side benefit, this makes it much more likely that you will be able to understand your solution when you go back to study for exams or the final! The bottom line: for any written work handed in for the course, including lab write-ups, exams, and homework, *you must show your work*.

I reserve the right to adjust policies in this syllabus if necessary during the quarter.

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning, discuss your concerns with the instructor. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations. Student Disability Services is located in Hogue 126. Call (509) 963-2214 or email ds@cwu.edu for more information.

Work due during the last week of classes: We will be covering new material through the end of the last week of classes. There may be homework due, and there will be a write-up from the regular Wednesday lab due on the Monday of finals week.

**Homework:** Homework will be assigned at the end of each section and will generally be due a week after it is assigned. See above for general comments about written work in the course. Homework must be stapled and written on clean-edged paper (no notebook fringes!) or it will not be accepted.

**Labs and Lab Write-ups:** The lab each Wednesday will include questions to be answered, including relevant statistical analyses. Your lab write-ups must be submitted through Canvas by 3PM on Mondays. *NO credit will be given for late work, and there are no dropped lab scores. If you submit the lab by 10AM on Saturday, and include a comment indicating that this is your final lab report, you will receive 1 extra credit point. Once you have included that comment, the version submitted will be the one graded.*

Lab write-ups must be typed, written in complete sentences, and follow the general guidelines for written work given above.

We will be making use of the statistical software R in class, and you will be using R for labs and exams. R is a free, open-source software package that is incredibly powerful. I strongly recommend the interface R Studio and this is what I will be using and demonstrating in class. R has a bit of a learning curve, but it's well worth working through! We typically use R in the advanced statistics courses in this department, and it's becoming more and more of a standard in industry and other disciplines.

**Exams:** Any changes to the tentative exam dates will be announced ahead of time in class.

Make-up exams must be arranged ahead of time unless you can document an unexpected circumstance beyond your control that prevented you from taking the exam. For instance, in the case of illness, a doctor's note will be required. All make-up exams must be requested as early as possible. Exams requested more than 24 hours after the scheduled exam will be given only in extreme extenuating circumstances (e.g. hospitalization, jail . . .). When a make-up exam cannot be taken in a timely manner, typically before exams are returned to the class, I reserve the right to instead replace that portion of the course grade with the final exam grade.

The final exam may be replaced by a final project; more details on this will be given as the quarter progresses.