

**Math 314 Fall 2019**  
**Probability and Statistics**

**Instructor:** Dr. Dominic Klyve

**Office:** Samuelson 218F

**Phone:** 963-2545

**E-mail:** dominic.klyve@cwu.edu

**Webpage:** <http://www.cwu.edu/~klyved>

**Office Hours:** Monday 10–11, Tuesday 10–11, Wednesday 1–2, Thursday 1–2, and by appointment

**Meeting times:**

Mon, Tues, Thurs, Fri, 11:00 – 11:50 in Samuelson 149

Wednesday, 11:00 – 11:50 in Samuelson 138 Computer Lab (unless otherwise announced)

**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:** *OpenIntro Statistics*, by Diez, Barr, and Çentinkaya-Rundel. This book can be bought inexpensively online, and is also available for free download. 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 *Probability and Statistics for Engineers* as PSE.)

- OpenIntro Chapter 1 (Introduction to data).
- 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).
- OpenIntro Chapter 4 (Foundations of inference).
- OpenIntro Chapter 5 (Inference for numerical data).
- OpenIntro Chapter 6 (Inference for categorical data).
- OpenIntro Chapter 7 (Introduction to linear regression).
- OpenIntro Chapter 8 (Introduction to multiple regression).

**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 (25%). Tentative exam dates are Wednesday, Oct. 16, and Wednesday, Nov. 13. The final exam will be given on Thursday, Dec. 12, from 8 - 10AM. 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*.

**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.* 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.

**General Course Policies:** Come to class. Do your own work. Work really hard; this class is likely to be quite difficult, but you will leave it with a useful set of skills, and a better understanding of statistics!

### **Academic Honesty**

Consult university policies (CWUP 5-90-040(22), CWUR 2-90-040(22), and WAC 106-125-020) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

### **Diversity Statement**

As a member of a peer learning community, a high degree of professionalism is necessary. **CWU expects every member of the university community to contribute to an inclusive and respectful classroom culture.**

### **Disability Support Services**

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, 509.963.2214, DS@cwu.edu

### **Is my absence excused?**

Excused absences will not lower your overall grade in this class and are determined on a case-by-case basis. Excused absences include illness, bereavement, and school-related activities. Documentation is required. Excused absences do not include travel for holiday breaks, work, or non-emergency travel delays.

In compliance with RCW 28B.137.010, Central Washington University makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.

I reserve the right to change the policies contained in this syllabus as dictated by developments during the quarter.