



MA 2611 – Applied Statistics I

Atwater Kent 233

M/T/R/F 12:00 PM – 12:50 PM

Professor Carly Thorp

Email: cthorp@wpi.edu

Office: Stratton Hall 102

Office Hours: Mon/Tues 2PM – 4PM and Friday 10 AM – 12 PM or by appointment

Why is a course on statistics important?

Statistics are EVERYWHERE. From social media to sportscasts to university grades, you will find statistics in your everyday lives. You will also find statistics in your future careers and, by taking this first step to understand the basic tools and applications, you will develop a greater appreciation for an often-underestimated field and learn how to use statistics wisely.

What does this course cover?

This course is designed as an introduction to applied statistics, with no prior knowledge of statistics needed, but a working knowledge of high school algebra is assumed.

By the end of this course, you should be able to:

- Construct data into descriptive statistics and distinguish between different types of data.
- Choose the best graphical tool for summarizing various types of data.
- Describe the basic rules of probability and apply those rules to simple event scenarios.
- Identify sources of variation and bias and describe data sampling methods; distinguish between different types of data distributions.
- Execute confidence intervals for mean and proportion in one sample cases.
- Explain how to conduct a hypothesis test and interpret the results for mean and proportion in one sample cases; define types of statistical errors.
- Recognize how to apply learned statistical methods to a variety of real-life scenarios.

Software Requirements

For your labs, the statistical software you will be using is *R*.

Why *R*? Well, for a couple of reasons... First, it's free and open-source, which makes it easily accessible for anybody, no matter what field they are studying or where they are working. Secondly, it is the primary software used by researchers and statisticians, so many of you will find it useful in your future studies and careers. Plus, it never hurts to add a new skill your resume!

Other statistical software packages are used within a variety of industries, some of which you may encounter, such as Minitab, JMP, and SAS. Additionally, Microsoft Excel is often used to conduct basic statistical calculations but not recommended if other statistical programs are available.

If interested in a more in-depth explanation of how to use *R*, I highly recommend:

The Book of R: A First Course in Programming and Statistics by Tilman M. Davies

Textbook and Reference Materials

While the course does not have a required textbook, if you are interested in delving a bit more into statistics and the history of statistics, I recommend the following books:

- *Naked Statistics: Stripping the Dread from the Data* by Charles Wheelan
- *How to Lie with Statistics* by Darrel Huff
- *The Lady Tasting Tea: How Statistics Revolutionized Science in the 20th Century* by David Salsburg

Utilizing Canvas

The primary method of communication you will be using in this course is Canvas.

The course comprises of five modules. For each course module, an overview, lecture materials, and assignments will be posted on Canvas. Lecture materials will be posted prior to class and any notes added to the lecture slides will be posted following class.

Assignments and Grading Policy

Your final grade in this course will comprise of:

SOURCE	PERCENTAGE	DUE DATES
Homework	35%	See Canvas
Labs	25%	
Quizzes	10%	
Midterm	15%	Apr 4 th
Final	15%	May 2 nd

A: [90 - 100] B: [80 - 90] C: [70 - 80] NR: below 70

I reserve the right to modify the above grading criteria, but not to lower the grade you would have received under the criteria stated. Due dates may be subject to change. Please allow 3-4 days after the assignment due date to receive a grade. Refer to the course calendar on Canvas for due date reminders.

Homework (35%): Assigned on a weekly basis, your homework will comprise of problem sets to practice the statistical applications learned in the corresponding module(s). I encourage you to work on homework assignments with your peers but do expect you to submit your own work. If you choose to submit homework assignments late, those that are a day late qualify for 80% of the grade, those two days late qualify for 60% of the grade. If you choose to submit homework later than two days after the due date, it will not be accepted. Grading rubrics will be posted on Canvas.

Labs (25%): In addition to your weekly classes, you will be attending a weekly lab with an assigned TA (refer to Canvas for your group TA assignment). As mentioned in the software section above, the labs will be used as an opportunity to learn *R* and how it applies to the course content. Like the homework assignments, I encourage you to work with your peers but do expect you to submit your own work. The late grading policy above for the homework also applies to the lab assignments.

Quizzes (10%): Over the course of the term, there will be five **take-home** quizzes on Canvas. You will have a 24-hour window in which to take each quiz and, once you start, will have 30 minutes to complete it, unless an approved accommodation applies. Open notes are allowed but it is expected you will take these quizzes **independently** from your peers. The quizzes will cover material since the previous quiz and/or exam and ask questions that demonstrate knowledge on how to apply statistical tools.

Midterm (15%) and Final (15%): Over the course of the term, you will have two exams. The midterm will cover material from the first half of the term and the final will cover material from the second half of the term. In a sense, the final *is* intended to be comprehensive, but, as many of you know, topics covered in math-based courses often build on top of each other, so you will need to have a healthy understanding of the material covered in the first half of the term to be successful understanding material covered in the second half of the term.

Echo360 Class Recordings and Zoom

If you are unable to attend a class or would like to review a particular class for studying, there will be recordings available via Echo360. **Contact me directly** for access to a particular Echo360 recording since these recordings will not be available through Canvas.

Additionally, I will be available on Zoom during office hours via <https://wpi.zoom.us/j/4013346284>

Academic Honesty

You are expected to be familiar with WPI's Academic Honesty policies. All acts of fabrication, plagiarism, cheating, and facilitation can be prosecuted according to the WPI's policies. If you are ever unsure as to whether your intended actions are considered academically honest, please contact me.

Student Resources

Mental Health & Physical Wellbeing

Your mental health and physical wellbeing are of utmost importance. If you are struggling with your health or wellbeing, please reach out to the Wellness Center or Student Development & Counseling Center (SDCC). Resources can be found on wpi.edu/student-experience/resources/be-well-together.

Accommodations

If you need accommodations or support throughout this course, you are encouraged to contact the Office of Accessibility Services (OAS) as soon as possible to ensure that such accommodations are implemented in a timely fashion. The OAS is in Unity Hall and can be reached via phone (508-831-4908) and/or email (accessibilityservices@wpi.edu).

Math Tutoring Center

In-person math tutoring will be offered in **Gordan Library Room 302**. Individual tutoring will be available from 10am-6pm Monday through Thursday and 10am-2pm on Fridays. Please use wpi.edu/+mtc to sign up for individual tutoring appointments.

Academic Resources Center (ARC) Tutoring

Peer tutoring and Math and Science Help (MASH) will be offered in-person by the Academic Resources Center (ARC) tutors in D Term. To sign up, use +tutortrac.wpi.edu for individual tutoring appointments. No appointments are needed for MASH group sessions.

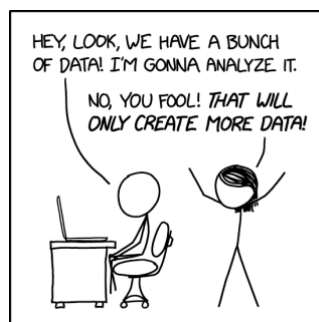
If you are looking for a tutor, please reach out to the Academic Resources Center (arc@wpi.edu) or submit your availability at Bit.ly/ARCTutor to request additional tutoring. Further instructions on MASH and tutoring offered by the ARC are located on the Academic Resources Center Canvas Page and on the Academic Advising and Academic Resources Center WPI Webpages.

Statement of Respect

As your professor, I expect you to treat your peers with respect and engage in considerate communication. Everybody comes to the table with different strengths, and weaknesses, so I encourage you to focus not only on your own strengths but also those of your peers.

To ensure you feel respected and part of a safe and accepting learning environment, please do not hesitate to reach out to me if any of the following are relevant to you:

- If you have a name and/or pronouns that differ from those in your official WPI records
- If something was said in class (by anybody) that made you feel uncomfortable and/or you feel like your performance is being negatively impacted by experiences outside of the course



Source: <https://xkcd.com/2582/>