

Math 171-11 Statistics Spring 2021

Canvas Does Not Know How to Compute the Final Grade in this Class

Instructor: William Abrams (abramswp@longwood.edu, 395-2188, Ruffner 327)

Office Hours: MW 1:30 - 2:30, TR 10:30 - 11:30 or by appt. Always on Zoom. Please remember you can always ask questions by email.

Course Description: An elementary statistics course designed to give students a working knowledge of the ideas and tools of practical statistics and their usefulness in problem solving and decision making. Topics include graphical displays of data, measures of central tendency and variability, elementary probability concepts, the normal distribution, correlation and regression, and confidence intervals and hypothesis testing for means and proportions. Special emphasis is placed upon the proper use and interpretation of statistics in real life situations. 3 credits. G5,WI,QR

Course Objectives:

By the end of the course, students will be able to:

- Explain various data collection methods for categorical and quantitative data and their roles in inference.
- Describe and analyze each type of data.
- Present and interpret data graphically (e.g., bar charts, histograms, and box plots).
- Compute and interpret measures of center and spread for quantitative data.
- Apply basic concepts of probability to find probabilities using the normal distribution.
- Explain the difference between experimental and observational studies and the types of conclusions that can be drawn from each.
- Use the Central Limit Theorem in relation to the sampling distribution of the sample mean or sample proportion.
- Use the appropriate basic tools of statistical inference including confidence intervals and tests of hypotheses for population means (z and t procedures) and population proportions.

For future secondary mathematics teachers, this course helps to satisfy the following CAEP sub-standards:

- A.4.1 Statistical variability and its sources and the role of randomness in statistical inference
- A.4.2 Creation and implementation of surveys and investigations using sampling methods and statistical designs, statistical inference (estimation of population parameters and hypotheses testing), justification of conclusions, and generalization of results

- A.4.3 Univariate and bivariate data distributions for categorical data and for discrete and continuous random variables, including representations, construction and interpretation of graphical displays (e.g., box plots, histograms, cumulative frequency plots, scatter plots), summary measures, and comparisons of distributions

Core Curriculum Objectives: Students will:

- engage in creative inquiry and cultivate curiosity.
- develop foundational knowledge and skills in the discipline (e.g., how to communicate, study, read, etc.).
- create and deliver writing appropriate to audience, purpose, and context.

As a Quantitative Reasoning course in the Core Curriculum, at the conclusion of the course, students will be able to:

- formulate a question/issue using appropriate mathematical, algorithmic, and/or statistical terms, and explain the decision process behind the choices made in that formulation.
- use mathematical, algorithmic, and/or statistical methods to gather and/or analyze data. Justification of the methods chosen should be included.
- determine the reasonableness of an answer and/or evaluate the explanations of data for reasonableness. Understand the limitations behind the methods used in the previous outcome.
- interpret the results of a mathematical, algorithmic, and/or statistical analysis. Present the interpretation in a context appropriate for a broader audience.

Text: You will need to be able to access the online book **Statistics by Learning Objective**. The best way to do that seems to be on WebAssign since you also need to be able to use WebAssign for homework. You can get this directly through WebAssign or through Cengage Unlimited using a credit card. I believe it is cheaper to use WebAssign if this is the only Cengage product you are using otherwise I believe it is cheaper through Cengage Unlimited. You should check the options yourself before you decide. To register at WebAssign you will need the class key. Note that you can register without paying but they will lock you out after a while so if you are not paying right away, wait until the last minute to register. You will need to pay before the class ends.

Calculator: You will need a calculator for this class. I suggest a TI-84, although you can get away with a TI-83. It must be able to perform all the confidence intervals and inference tests we do in this class (One and two sample for mean and proportion) as well as calculating basic statistics and normal probabilities. If you have another calculator that can do all this you are welcome to use it. But I will not be able to help you with it very much.

Course Structure: This is a three credit course so it meets either in person or virtually at least 2.5 hours per week. It is assumed that students will spend a minimum of 5 hours per week outside of the course meetings working on this course. This totals a minimum of 112.5 hours for this course this semester. Because of the current unpleasantness involving Covid-19, this outside of

class work will include reading the text, watching videos, taking book quizzes, doing homework, taking tests, taking the final, and creating projects. In addition the time will include studying and working in your group.

More specifically, this class will be partly flipped, meaning you are expected to encounter the material on your own or in your group before class. You will do this by reading the text, see below for details, and watching the videos, then taking a book quiz. In class I will show you examples, or you will work on problems in groups, or I will do small lectures on material that is causing people problems or more difficult material not in the videos, etc. Then you will complete the homework, tests, and projects both to show me that you learned it and to continue your learning. The details are in the sections below.

Class Meetings and Groups: You must wear a cloth face covering over your nose and mouth when you are in class or in the building coming to or leaving class. You must stay six feet away from everyone else whenever possible. No eating or drinking is allowed in class.

You will be divided into groups for cooperative work. You will be expected to have arranged a way to communicate with your group members during class. You all probably know more ways to do this than I do but I know about texting, Facebook Messenger, Zoom, Google Hangouts, and Miro. For class work, book quizzes, and homework you are allowed to work in groups.

If this class has to move online, either temporarily or permanently, it is my intention that the course will stay exactly the same except that everyone will be online during class meetings. These class meetings will occur on Zoom at the same time as class would have occurred.

If you want to use Zoom to take this class for any reason you must have permission in advance from the instructor. Obviously this is just a formality for students who have Covid-like symptoms, who have been exposed to Covid recently, or need to stay in for any other reason related to Longwood's Covid rules.

Caveat: More than any other time I have taught, this year is in flux. I reserve the right to change some of the details of this syllabus. If I choose to do that I will explain to you what I am changing and why, I will give you a chance to comment or try to change my mind, I will respond to your comments, and I will give you some time to get used to it. If I have to change something I will do my best to make sure it does not adversely affect your grade.

Attendance: Attendance will be taken regularly for both in-class or on-line students. The instructor has the right to automatically fail any student who misses 25% of classes. I strongly suggest that if you cannot attend class you let me know and tell me why.

Course Requirements: You will take book quizzes, tests, homework, projects, and a final. The book quizzes will be worth 5%, the tests 35%, the projects 15%, the homework 20% , and the final 25%. You are **required** to check your email, WebAssign, and Canvas (Announcements and Modules) at least once every twenty-four hours. Canvas does not compute final grades. I will try to arrange it so Canvas always says your final grade is zero, but that might not work.

Very Tentative Schedule:

week	dates	topics	assignments	who knows
1	Jan. 13 - 15	Introduction 1.1A - 1.4A		
Jan. 18 - MLK's Birthday				
Jan. 21 - Last Day to Add or Drop Classes				
2	Jan. 19 - 22	Studies and Sampling, 2.1A - 2.3C, 3.1A - 3.5B		
3	Jan. 25 - 29	Numerical Measures 4.1A,B,4.2A - B, 4.3A - C		
4	Feb. 1 - 5	Tables and Graphs 5.1A - C, 6.1A,6.3 E,H	Test I (Feb. 5- 6)	
5	Feb. 8 - 12	Probability 7.1A-D		
6	Feb. 15 - 19	Normal Dis- tribution and CLT 12.1A - 12.2I, 14.1 A - C		
7	Feb. 22 - 26	Estimation for One Sample 15.1A - E		
Mar. 1 - No Classes				
8	Mar 2 - 6	Estimation for One Sample 15.1A - E	Test II (Mar. 6 - 7)	
Mar. 11 - Grade Estimates Due				
9	Mar. 8 - 12	Estimation for One Sample 15.2A - C		

week	dates	topics	assignments	who knows
10	Mar. 15 - 19	Estimation for Two Samples 16.1A - 16.3B		
11	Mar. 22 - 26	Hypothesis Test for One Sample 17.1A - E	Test III (Mar. 26 - 27)	
Mar. 31 - Last Day to Withdraw from a Class April 1 - 2 - No Classes				
12	Mar. 29 - Mar. 31	Hypothesis Test for One Sample 17.2 A - C		
13	Apr. 5 - 9	Hypothesis Test for Two Samples, 18.1A - B		
Apr. 14 - Symposium				
14	Apr. 12 - 16	Hypothesis Test for Two Samples, 18.3A - B	Test IV (Apr. 16 - 17)	
15	Apr. 19 - 23	Two Way Tables and Inferential Statistics		

April 26 - Review for Final

Final Exam: April 28, 8 - 10:30 am (Online)

Grading: Suppose your numerical grade is x . If $92 \leq x < 100$ then you get an A. If $90 \leq x < 92$ then you get an A-. If $88 \leq x < 90$ then you get a B+. If $82 \leq x < 88$ then you get a B. If $80 \leq x < 82$ then you get a B-. If $78 \leq x < 80$ then you get a C+. If $72 \leq x < 78$ then you get a C. If $70 \leq x < 72$ then you get a C-. If $68 \leq x < 70$ then you get a D+. If $62 \leq x < 68$, then you get a D. If $60 \leq x < 62$ then you get a D-. If $x < 60$ then you get an F. Canvas does not compute final grades. I will try to arrange it so Canvas always says your final grade is zero, but that might not work.

Book Quizzes: Book Quizzes will be due in general by Monday morning by 7:45 am. They will be open by Saturday afternoon. You may work on book quizzes with other members of your group but you may get help from no other sentient beings. Book Quizzes will be labeled with the length of time you are allowed to work on them and which book sections and videos you are expected to look at before you take them. Book quizzes are timed. You get one chance. You may use any non sentient material you wish. I will drop one book quiz. There will be no make up book quizzes.

Tests: Tests will be taken on Canvas using HonorLock, which means you have to use the Chrome browser with the HonorLock extension. Tests are individual work. You may only use your calculator and blank paper in case you need it. Tests will open on Friday at noon and close Saturday at noon. You may not talk to anyone else about the test during that time. If you miss a test with a valid excuse which you have told me about in advance of the test (or told me why you could not and the reason was good enough) then your final exam grade will count for that test grade. Please remember that you will be recorded during your Tests.

Homework: Homework assignments will be on WebAssign. They will open on Friday and close on Friday. I do not guarantee when they will open but they will close at midnight. Homework assignments allow for three tries. You can use any materials you want except for talking to people not in your group. You may always talk to the instructor. I will drop one homework assignment.

Projects: There will be three projects in this class. In each project you will be graded on content as well as grammar and organization. (If I cannot understand what you are saying you fail at all three.) Each project needs to address the four objectives listed above for quantitative reasoning. In particular you should be carefully formulating the question, describe the methods you would use to solve it (and then using those methods), discuss or evaluate the reasonableness and limitations of your answer, and then give or interpret your results in the context of the initial problem and for the appropriate audience.

You should use the comments you get on each project to help you do better on the next one. This means that my expectations will go up for each project. You are free to have anyone read the project and let you know what does not make sense to them, but you cannot have them suggest ways to fix it. You have to fix it yourself.

Projects are individual work. You can only get help on the projects from the instructor and, for the writing itself, from the Writing Center. You may use non sentient resources but you must indicate in the paper that they were used. The project will be turned in online. You should use a reasonable format that I can read. If you are not sure, check with me.

Final Exam: The final exam will also be on Canvas using Honorlock. It will be cumulative. Details on the Final Exam will be forthcoming.

A Suggested Schedule: I suggest the following. There will need to be some variation (forexample if you have a project due) and there is no requirement you do it all this way.

- Sunday - Read the material, view the video(s), and take the Book Quiz.
- Monday through Wednesday - Attend two classes and do the homework once or twice as necessary.
- Thursday through Friday - Attend one class, finish the homework, study for the test.
- Friday through Saturday - Take the test if there is one. Start the material and videos

Office Hours: Office Hours will be held using Zoom. In extreme cases we can find a place to meet, but we will need to be masked and eight feet apart at least.

HonorLock: HonorLock requires Chrome with the HonorLock plug inn, a camera, and a decent internet connection. The tests require a quiet place to work. You are responsible for making sure you have that.

Getting Started with Honorlock can be found at

<https://honorlock.com/assets/2017/students/CanvasGuide.pdf?r=66b>

You can get Chrome at <https://www.google.com/chrome/> When taking an Honorlock assessment, follow these guidelines:

- Honorlock is not a live proctoring-service, you do not need to schedule an appointment with Honorlock in advance
- Use Google Chrome and ensure you have the Honorlock Chrome Extension (www.honorlock.com/extension) (Links to an external site.)Links to an external site.)
- Ensure you are in a location where you wont be interrupted
- Turn off all mobile devices, phones, etc.
- Clear your desk of all external materials books, papers, other computers, or devices
- Remain at your desk or workstation for the duration of the test
- Make sure your webcam is plugged in or enabled before clicking Take the Exam
- When you are ready, click Take your Exam to start the authentication process
- If you are asked for an access code, it means you are not in Google Chrome or do not have the Honorlock Chrome Extension installed
- Know that you will be recorded during the assessment to ensure youre using only permitted resources
- Honorlock will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

For technical difficulties with Honorlock, please contact Honorlock directly. Call (1-855-828-4004) or e-mail support@honorlock.com .

Honor Code: All of your turn in work is covered by the Longwood University Honor Code. If you are caught using resources that you are not allowed to use, you will get a zero on the assignment and your name will be turned over to the Longwood University Honor Board. If you are uncertain what you are allowed to use on an assignment, consult with the instructor immediately.

Syllabus Statements:<http://www.longwood.edu/academicaffairs/syllabusstatements/>

Technology Policy: Learning mathematics requires focus for extended periods of time. As practice for that, you should be able to last for the length of a class without needing to send or receive

a call or text. You can do it. Seriously.

Calculator Rental: Pi Mu Epsilon (the Mathematics Honor Society) has a few calculators that can be rented for a semester. If you would like to rent a calculator, then you should see the director of the QR Center (located in 111 Allen Hall), Dr. Shilling-Stouffer during her office hours (adjacent to the QR Center). You can also arrange for contactless pickup by emailing Dr. Shilling-Stouffer at shillingln@longwood.edu. Calculators will be rented on a first-come, first-served basis. MASKS MUST BE WORN DURING CALCULATOR PICK-UP IF DONE IN PERSON. The cost of renting a calculator is \$50 (must be EXACT cash in an envelope with your full name clearly written, please) for one semester. At the end of the semester, you will receive \$25 back (so it technically costs only \$25 if returned). If it is not returned by the end-of-semester date, then you will not be refunded \$25 and you will be required to pay an additional \$75 to replace the calculator.