

STAT 1000 (1010): Applied Statistical Methods

Spring 2021

Lecture Hours: M/W/F 11:05-11:55 AM, 157 Benedum Hall
Instructor: Junshu Bao
Email: jub69@pitt.edu
Office Hours: Wednesdays 3 – 4 PM
Thursdays 11 AM -12 PM or by appointments
TA: Wei Peng (wep15@pitt.edu)
Office Hour: Thursdays 2:30 – 3:30 PM
Jiashen Lu (jias.lu@pitt.edu)
Office Hour: Thursdays 1 – 2 PM

Recitation: One of the following:

1015	TH	12:10 – 1:00 PM	Wei Peng
1020	TH	1:15 – 2:05 PM	Wei Peng
1025	TH	2:20 – 3:10 PM	Jiashen Lu
1030	F	10:00 – 10:50 AM	Jiashen Lu

Textbook: Moore, D.S., G.P. McCabe and B.A. Craig, *Introduction to the Practice of Statistics*, 9th Ed., W.H. Freeman and Company, 2017. ISBN: 9781319013387.

Course Description

This course is an intensive introduction to statistical methods. It is designed for students who want to do data analysis and to study further ideas in applied statistics beyond this course. The topics covered include descriptive statistics, elementary probability, random sampling, controlled experiments, hypothesis testing, regression and the analysis of variance. By the end of the semester, students will be able to

- Understand basic concepts of statistics and probability which include descriptive statistics, elementary probability, random sampling, controlled experiments, inference procedures, regression and the analysis of variance;
- Be proficient in the use of Minitab and apply basic statistical techniques to a variety of subjects with the aid of Minitab statistical software;
- Understand, analyze, and criticize quantitative arguments.

Note: The material in this course is cumulative in nature. Thus, it is important to not fall behind in your reading or assignments or you will find yourself lost.

Software

Throughout the semester we will use the statistical software package MINITAB. This package is available for download from my.pitt.edu for free. Please note that MINITAB is not available on Macs but is MINITAB Express. For the purposes of this course, MINITAB and MINITAB Express are equivalent. MINITAB is also available in all computing labs on campus, including the STAT Lab (WWPH 1201) and CL G-26.

Canvas

We will be using Canvas as the learning management system (LMS) for this course. You should visit Canvas (<http://canvas.pitt.edu>) at least once a week. Here you will find all relevant course material.

Grades

Grades for this course will be calculated according to the following breakdown.

Homework assignments	25%
Midterm 1	15%
Midterm 2	15%
Quizzes (6 quizzes)	12%
Labs (4 labs)	8%
Final Exam	25%

Homework Assignments

Homework assignment will be posted on Canvas. All assignments will be submitted electronically through Canvas on most Fridays beginning the third week of class.

Rules:

- **All assignments should be your individual work**; otherwise, points will be deducted.
- **Late homework will not be accepted.**
- Your homework should be neat and well-organized. Show your work and circle your answer.
- Be sure to **print your name and your recitation time** at the top of the first page of your homework.

Examinations

The three exams (two midterms and one final exam) will be open book but timed. Exams will be posted on Canvas. You will have certain amount of time to work on it. Once you finish, you should submit it electronically through Canvas. No make-up exams will be given. If you'll miss an exam (an extremely rare event for an unavoidable emergency), please let me know as soon as possible.

Quizzes

There will be a total of 6 quizzes given throughout the semester in recitation (each worth 2% of the grade). These quizzes are open book. Quizzes will be posted and submitted through Canvas. A prepared sheet is recommended as you won't have a lot of time to search for needed information. In general, memorization of lengthy, complicated formulas is not necessary for this course, but you should know where to find the formulas for quizzes. No make-up quizzes will be given.

Labs

During selected weeks, you will complete a lab during recitations. Each lab worth 2% of the grade.

Attendance/ Class Participation

Attendance is not mandatory, although very strongly encouraged as the material tends to be difficult to learn on your own. Regular attendance and active participation will surely positively impact your performance in the course.

Free Tutoring

Beyond lecture, recitation, my office hours and your TA's office hours, there is a free tutoring service available to Pitt students in the introductory statistics courses. Graduate statistics students who are available to help you on your homework assignments staff the Statistics Lab in WWPH 1201. Refer to <http://www.stat.pitt.edu/resources/statistics-computing-lab> to see when the lab is staffed and when it is reserved for other recitations.

Academic Integrity

Students in this course are expected to comply with the University of Pittsburgh's Academic Integrity policy, which can be found at <http://www.as.pitt.edu//fac/policies/academic-integrity>. Any student found blatantly copying another student's homework assignment will receive a zero for that assignment. Any student allowing another student to copy his/her homework will also receive a zero for the assignment. Any student found cheating on an exam or assisting others in cheating on an exam will receive an F for the course and may be subject to further disciplinary action. Generally speaking, it is expected that you do not lie, cheat, or steal in your academic endeavors (As the great Mr. Feeney once said, "Do good").

Disabilities

Students with documented disabilities are entitled to reasonable accommodations if necessary. If you have a disability that requires special accommodations, please contact Disability Resources and Services in 140 William Pitt Union no later than the second week of the semester. Their website is <http://www.drs.pitt.edu/> and their phone number is 412-648-7890. Accommodations will not be granted retrospectively. They will verify your disability and determine reasonable accommodations for this course.

Tips for a Successful Semester

1. Keep an eye on the schedule for the course. While this schedule is subject to change, it is still an accurate depiction of the pacing of the class.
2. Homework is an easy way to score **major** points in the semester. The problems aren't designed to stump you, but to help you solidify what you already know. Regularly completing assignments is a great way to keep track of what you are learning in the class.
3. If you find yourself stuck on a topic or problem, ask for help! Both your TA and myself are here to facilitate YOUR learning! Don't wait until the night before an exam to send frantic emails. Just like you should be keeping an eye on the schedule of the course, you should be keeping an internal watch on your own understanding of the material. If you find yourself beginning to struggle in a subject, reach out to one of us.
4. Focus on the big picture of the problem at hand. This class may have a decent amount of mathematics in it, but at its heart, statistics is all about the context of the problem. Computers can do the math, but statistics is all about how to interpret the results of the mathematical analysis.

Course Grades:

A+	$\geq 97\%$
A	$93 - < 97\%$
A-	$90 - < 93\%$
B+	$87 - < 90\%$
B	$83 - < 87\%$
B-	$80 - < 83\%$
	etc...

Tentative Class Schedule

Date	Day	Lecture	Reading	Recitation	Homework
1/20	W	Introduction and Types of Variables	Section 1.1	N/A	
1/22	F	Graphical Display	Section 1.2		
1/25	M	Descriptive Statistics	Section 1.3		
1/27	W	Density Curves and Normal Distributions	Section 1.4	Lab 1	
1/29	F	Normal Distributions			
2/1	M	Correlation			
2/3	W	Simple Linear Regression	Chapter 2	Quiz 1	
2/5	F	Two Way Tables			HW 1 due
2/8	M	Sources of Data, Sampling Design	Chapter 3		
2/10	W	Design of Experiments		Lab 2	
2/12	F	Introduction to Probability	Sections 4.1, 4.2		HW 2 due
2/15	M	Probability rules (1)	Section 4.5		
2/17	W	Probability rules (2)		Quiz 2	
2/19	F	Random Variables	Section 4.3		HW 3 due
2/22	M	Mean and Variances	Section 4.4		
2/24	W	Review		Q & A	
2/26	F	Midterm 1			HW 4 due
3/1	M	Sampling Distributions (1)			
3/3	W	Sampling Distributions (2)	Chapter 5	Quiz 3	
3/5	F	Sampling Distributions (3)			
3/8	M	Estimation - One Mean (z)	Section 6.1		
3/10	W	Hypothesis Testing – One Mean (z)	Section 6.2	Quiz 4	
3/12	F	Power	Section 6.4		HW 5 due
3/15	M	Hypothesis Testing – One Mean (t)	Section 7.1		
3/17	W	Estimation – One Mean (t)	Section 7.1	Quiz 5	
3/19	F	Matched Pairs t Procedures	Section 7.1		HW 6 due
3/22	M	Inference for Two Means (z)	Section 7.2		
3/26	F	Inference for Two Means (t)	Section 7.2	Q & A	HW 7 due
3/29	M	Inference for a Single Proportion	Section 8.1		
3/31	W	Review		Lab 3	
4/2	F	Midterm 2			HW 8 due
4/5	M	Comparing Two Proportions	Section 8.2		
4/7	W	Inference for Two-Way Tables	Section 9.1	Quiz 6	
4/9	F	Goodness of fit	Section 9.2		
4/12	M	Analysis of Variance (1)	Section 12.1		
4/14	W	Analysis of Variance (2)	Section 12.1	Lab 4	
4/16	F	Regression Inference (1)	Section 10.1		HW 9 due
4/19	M	Regression Inference (2)	Section 10.2	Q & A	

4/21 W Review for the final exam

4/23 F Review for the final exam

HW 10 due

Material References:

Moore, D. S., Notz, W.I., & Flinger, M.A., *The basic practice of statistics*, the 8th Ed, New York: W.H. Freeman and Co.

Moore, D. S., McCabe, G. P., & Craig, B. A., *Introduction to the practice of statistics*, 9th Ed., New York: W.H. Freeman.

Pfenning, N. (2011). *Elementary statistics: looking at the big picture*. Boston, MA: Brooks/Cole Cengage Learning.