

DEPARTMENT OF ANTHROPOLOGY
Anthropology 1534/2534
Fall Term, 2022

UNIVERSITY OF PITTSBURGH
Archeological Data Analysis I
Instructor: Dr. Alexander J. Martín
ajm37@pitt.edu

SYLLABUS

COURSE DESCRIPTION

This course is an introduction to basic principles of statistics as applied to the analysis of archeological data. It teaches students how to analyze and interpret archaeological data using statistical techniques for measuring and comparing the level, spread, and dispersion of batches of numbers; how to use samples to represent an unknown universe; as well as how to compare categorical and numerical variables through common statistical techniques such as ANOVAS, Chi-Square tests, and linear regressions, among others.

We all meet together face-to-face for two hours for a weekly lecture, then divide up into three separate lab sections (one lab section for graduate students and two for undergraduates).

COURSE OBJECTIVES

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

1. Understand important statistical principles and how they can best be applied to archaeological cases.
2. Use statistical techniques to understand and explain socio-cultural phenomena in prehistory.
3. Be able to assess and be critical of the use of specific statistical approaches and techniques in the academic literature and professional settings.

REQUIREMENTS

The text for the course is *Statistics for Archeologists: A Commonsense Approach* (second edition, 2009, the one with the red cover; FREE AS A PDF THROUGH THE LIBRARY). Reading assignments for each Monday class are listed on the schedule below. You should look the assigned material over before class on Monday, but it is probably not the best use of your time to read it all carefully and try to master it before class. That's what we'll discuss in class. You should definitely bring the book with you both to class and to lab.

For our labs, we will be using the statistical software R (alongside RStudio), which is available on all of the University's computing labs, as well as for you to install on your personal computer free of charge.

All materials for this course will be posted on CANVAS.

METHODS OF EVALUATION

Grades will be based on weekly exercises (60%), midterm exam (15%), and final exam (25%). The midterm will be in class; the final will have an in-class section and a take-home section.

The weekly exercises are essential, and it is important not to fall behind on them. All exercises must be completed by the date when they are due. Late assignments will be lowered by 2 whole

points (out of a maximum of 5 points per exercise). The lowest grade for an exercise handed in, no matter how late, is 0.0; the grade for an exercise not handed in at all is below that: -2.0.

Working together on lab assignments is a good thing. Everyone is likely to learn more, as you figure out the techniques involved, but finally you must write up your own exercise to hand in independent of other students.

Grading Scale

A	90% and above
B	80-89%
C	70-79%
D	60-69%
F	59% and below

("+" and "-" are added to these grades according to the University's grading schema)

SCHEDULE

Week	Date		Topic	Read	Assignment
1	8/29	Lecture	Batches of numbers and their levels	Ch 1 & 2	Ch 1 & 2 (on paper)
	8/29	Lab (Grd.)	<ul style="list-style-type: none"> • R basics; Steam-and-Leaf Plots and Measuring the Center of the Batch • Export R Output to WORD to PDF 		
	8/31	Lab (Und.)			
2	9/5	Lecture	NO CLASS (Labor Day)		Ch 1 & 2 (with R)
	9/5	Lab (Grd.)	NO CLASS (Labor Day)		
	9/7	Lab (Und.)	<ul style="list-style-type: none"> • Separating batches, trimmed means, and back-to-back stem-and-leaf plots with R 		
3	9/12	Lecture	Spreads and comparing batches	Ch 3 & 4	Questions at the end of Ch 3 & 4
	9/12	Lab (Grd.)	<ul style="list-style-type: none"> • Trimmed Means and Standard Deviations, Removing Level and Spread • Box-and-Dot Plots 		
	9/14	Lab (Und.)			
4	9/19	Lecture	Shapes and transformations; categories and bar graphs	Ch 5 & 6	Questions at the end of Ch 5
	9/19	Lab (Grd.)	<ul style="list-style-type: none"> • Transformations with R 		

	9/21	Lab (Und.)	(from Ch 5)		
5	9/26	Lecture	Samples and populations	Ch 7 & 8	Questions at the end of Ch 6 & 7
	9/26	Lab (Grd.)	<ul style="list-style-type: none"> • Categories and groups, cross tabulations, and bar graphs (from Ch 6) 		
	9/28	Lab (Und.)			
6	10/3	Lecture	Confidence and population means	Ch 9	Questions at the end of Ch 9
	10/3	Lab (Grd.)	<ul style="list-style-type: none"> • Error ranges and confidence levels in R 		
	10/5	Lab (Und.)			
7	10/10	Lecture	Resampling; Categories and population proportions	Ch 10 & 11	Questions at the end of Ch 10 & 11
	10/10	Lab (Grd.)	<ul style="list-style-type: none"> • SPSS medians and error ranges with resampling approaches 		
	10/12	Lab (Und.)			
	10/17	Lecture	Midterm	NO CLASS	
	10/17	Lab (Grd.)	NO CLASS		
	10/19	Lab (Und.)	NO CLASS		
8	10/24	Lecture	Comparing two sample means	Ch 12	Questions at the end of Ch 12
	10/24	Lab (Grd.)	<ul style="list-style-type: none"> • Displaying error bars for two sample means • <i>t</i> tests 		
	10/26	Lab (Und.)			
9	10/31	Lecture	Comparing means of more than two samples	Ch 13	Questions at the end of Ch 13
	11/2	Lab (Grd.)	<ul style="list-style-type: none"> • Displaying error bars for multiple sample means • Recoding variables with "Transform" • ANOVA 		
	11/2	Lab (Und.)			
10	11/7	Lecture	Comparing proportions of	Ch 14	Questions at

			different samples		the end of Ch 14
	11/7	Lab (Grd.)	<ul style="list-style-type: none"> • Chi-square • Grouping multiple categories • Producing a Chi-square from already tabulated data 		
	11/9	Lab (Und.)			
11	11/14	Lecture	Regression and correlation	First part of Ch 15 (pp. 199–213)	Small assignment on how scatterplot shape affects correlations
	11/14	Lab (Grd.)	<ul style="list-style-type: none"> • Scatter plots • Linear regressions 		
	11/16	Lab (Und.)	<ul style="list-style-type: none"> • Correlation coefficients and their measures of strength 		
	11/21	Lecture	NO CLASS		
	11/21	Lab (Grd.)	NO CLASS		
	11/23	Lab (Und.)			
12	11/28	Lecture	Regression and correlation (cont'd)	Rest of Ch 15	Questions at the end of Ch 15
	11/28	Lab (Grd.)	<ul style="list-style-type: none"> • Regression residuals analysis. 		
	11/30	Lab (Und.)	<ul style="list-style-type: none"> • Transformations 		
13	12/5	Lecture	Rank-order correlations	Ch 16	Questions at the end of Ch 16
	12/5	Lab (Grd.)	SPSS Spearman's rank-order correlation		
	12/7	Lab (Und.)			
	12/12-12/16		Final examination period for classes	Ch 20	--Take-home final handed out