DEPARTMENT OF ANTHROPOLOGY
Anthropology 2524 (31213)
Spring Term, 2023

UNIVERSITY OF PITTSBURGH
Archeological Data Analysis II
Instructor: Dr. Alexander J. Martín
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SYLLABUS

COURSE DESCRIPTION

This course expands on the skills introduced on Archaeological Data Analysis I for graduate students by exploring more advanced sampling strategies, the application of multivariate statistical analysis, as well as other exploratory techniques such as diversity and inequality indices, network analysis, and gravity models in the context of archaeological cases. Beyond these skills, the course also provides you with the high-level analytical skills needed for making the archeological record tell you what you need to know, as well as helping you do a good job at telling your readers what they need to know about the patterns you've found in your data so they'll understand how those patterns support your conclusions. The course is not really about what we need to get the archeological record to tell us or why we need to know that—discussion at that level takes place in a number of other seminars— but we will assume here a broadly shared notion of the sorts of things we need to figure out about human activities and organization in the past in order to understand better the dynamics of long-term social change.

Finally, this course is also about research design, since data analysis is not something you begin to think about only after you come back from the field. A clear and concrete vision of the analysis you will carry out to delineate the patterns you are interested in is an essential part of good research design, and good research design is the foundation of writing convincing proposals for funding and for carrying out meaningful research. If you don't develop this clear vision of the analysis you're headed toward before you carry out fieldwork, it is unlikely that you will come back from the field with a dataset that can tell you very much.

COURSE OBJECTIVES

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

1. Understand advanced statistical techniques and how they can best be applied to archaeological cases.
2. Be able to assess and be critical of the use of advanced statistical approaches and techniques in the academic literature and professional settings.
3. Effectively use these skills to support your arguments about prehistoric socio-cultural phenomena in research proposals, dissertation work, and academic articles.

BOOK AND SOFTWARE REQUIREMENTS

The text for the course is Statistics for Archeologists: A Commonsense Approach (second edition, 2009, the one with the red cover). Reading assignments for each Wednesday class are listed on the schedule below. For our labs, we will be using the statistical software R, which is available on all the University's computing labs, as well as for you to install on your personal computer through the University's software distribution program.

All materials for this course will be posted on CANVAS, on either the lecture or lab sections accordingly.

METHODS OF EVALUATION

Written exercises will be due almost every week. Most of the learning happens in working on the exercises. Exercises will usually be discussed in class before we go on to the next topic, so they all must be completed by the specified due date. Please be aware that no late assignments will be accepted, and only in the most extraordinary circumstances will I consider giving a grade of incomplete for this course.

Also, be aware that these exercises can sometimes require a lot of work—you may think you're almost finished, and many hours later you may still think you're almost finished. Don't plan to start them on the night before they are due. It's an excellent idea to work together with others on the exercises and figure things out together. In the end, however, each of you must do your own work and write up your own exercise.

Your course grade will be based on the degree to which your exercises and your participation in class discussion show that you have mastered the tools we deal with. There is no paper, exam, or any other requirement beyond the weekly exercises and participation in class discussions.

Also, please be advised there is no extra credit for this class.

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 standard grading schema)

SCHEDULE

Week	Date	Topic	Readings
1	1/9	Sampling a Population with Subgroups Using R Notebooks	Chapter 17
2	1/16	Sampling a Site or Region with Spatial Units (*Cluster Sampling*)	Chapter 18
3	1/23	Sampling without Finding Anything; Sampling and Reality Professional Illustrations (Adobe Illustrator)	Chapter 19 and Chapter 20
4	1/30	Multivariate Approaches and Variables Intro to HTML coding: Creating an index landing page	Chapter 21
5	2/6	Quantification and Diversity Indices	Readings posted on Canvas

			(Martín and Murillo Herrera 2014)
6	2/13	Similarities between Cases	Chapter 22
7	2/27	Multidimensional Scaling	Chapter 23
8	3/13	Principal Component Analysis	Chapter 24
9	3/20	Hierarchical Clustering (by Cases)	Chapter 25 (pp. 309-316)
10	4/3	Hierarchical Clustering (by Variables)	Chapter 25 (pp. 316-320)
11	4/10	Non-hierarchical (K Means) Clustering	
12	4/17	Inequality Indices (Lorenz Curve and GINI Coefficient)	(Peterson and Drennan 2018)
13		Network analysis/Spatial Syntax	
	4/24	Exam week (no exam for this class)	

Bibliography

Martín, Alexander J., and Mauricio Murillo Herrera

2014 Networks of interaction and functional interdependence in societies across the Intermediate Area. Journal of Anthropological Archaeology 36:60-71.

Peterson, Christian E., and Robert D. Drennan

2018 Letting the Gini out of the bottle: measuring inequality archaeologically. *In* Ten thousand years of inequality: the archaeology of wealth differences. T.A. Kohler and M.E. Smith, eds. Pp. 39-66. Tucson: University of Arizona Press.