

ANTH 182 / ANTH 245  
QUANTITATIVE ANALYSIS IN ARCHAEOLOGY  
M 9:00-11:50  
SSMS 1303

Professor: Dr. Amber VanDerwarker

Office: HSSB 1038

E-mail: [vanderwarker@anth.ucsb.edu](mailto:vanderwarker@anth.ucsb.edu)

Professor Office Hours: Thursdays 10am-12pm or by Appt. (email for an appointment / my schedule is fairly flexible before 2:30pm if you cannot make my office hours, so email me for an appointment if needed.)



## I. Course Description/Objectives:

Let's face it: students are afraid of statistics. But in the world around us, people throw statistics at us left and right in order to make arguments and prove points, all in an effort show us that their diet plan works better or their new pharmaceutical has negligible side effects. We rely on other people's statistics to make decisions about our daily activities – what foods to eat, what medicines to take, what cars to buy, what politicians to vote for. It is important that we understand just what these statistics are really telling us.

This course is designed specifically for archaeological research. We all have questions about the world – that's why we're here. In order to answer these questions, we need certain tools. We must take generalizations about the world (e.g., "boys are better at math") and examine them. How do we prove or disprove this statement? We collect data that are relevant to the questions. Perhaps we end up with millions of data points that are relevant to this question. How do we make sense of all this information? That's where statistics become relevant – this is our tool for weighing evidence that is relevant to our questions. If we don't assess the evidence that is pertinent to answering our questions, then we fail as social scientists.

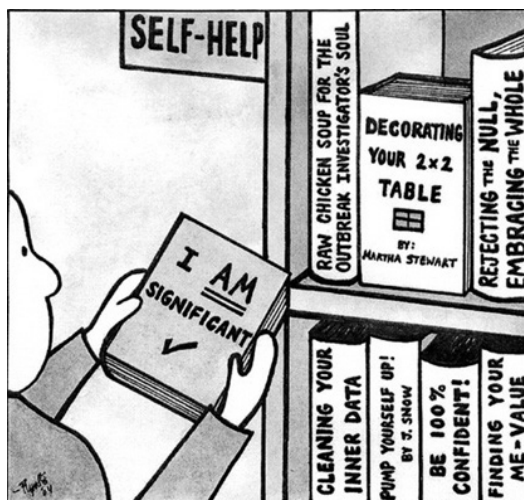
My approach to this course is practical and hands-on: 50% of the time I will lecture on important statistical concepts and techniques, and the other 50% of the time we will be working on in-class exercises in which we will apply these statistical concepts to real and hypothetical archaeological problems. We will be using Microsoft Excel and MYSTAT to complete these exercises, which will enable us to learn practical application of statistics software (no one computes statistics by hand anymore!).

I know that this course may seem daunting at the outset, but I am confident that we can do this together. If you keep up with the reading and assignments, you will do just fine. This is one of the most important and applicable classes you take in your major. Without knowledge of applicable statistical concepts, you will never be an effective archaeologist.

## II. Required Reading:

You must come to class having already read the assigned reading for that date. In addition, I will be presenting some material that is not covered in the course text. Thus, you are responsible for attending class and taking notes. I do not distribute my lecture notes, so do not ask me for them – If you miss a class, you must get the notes from a fellow classmate. Powerpoints, however, will be posted on Gaucho Space, along with course assignments.

- VanPool, Todd L., and Robert D. Leonard, 2011, Quantitative Analysis in Archaeology. Wiley-Blackwell, ISBN 978-1-4051-8950-7
- Cowgill, George, 1990, Why Pearson's  $r$  is not a good similarity coefficient for comparing collections. *American Antiquity* 55(3): 512-520 (PDF on Gaucho Space)
- Kintigh, Keith, 1984, Measuring archaeological diversity by comparison with simulated assemblages. *American Antiquity* 49(1):44-54, **AND** Kintigh, Keith, 1989, Sample size, significance, and measure of diversity. In *Quantifying Diversity in Archaeology*, edited by R. D. Leonard and G. T. Jones, pp. 85-91. Cambridge University Press, New York.
- Baxter, Chapters 5 & 6 (PDF on Gaucho Space; PDF title is Baxter CA & PCA)



## III. Assignments and Grading:

Your total grade is based on **attendance/participation**, 7 lab **assignments**, and 3 **quizzes**. There is NO final exam in this course. Each person is graded on their own performance – no one is in competition with each other and no one is graded with reference to any other individual. If you do the work and meet the requirements as outlined below, you should perform well in the course.

### Grading Scale:

A+	=	97-100	C	=	73-76
A	=	93-96	C-	=	70-72
A-	=	90-92	D+	=	67-69
B+	=	87-89	D	=	63-66
B	=	83-86	D-	=	60-62
B-	=	80-82	F	=	59 and below
C+	=	77-79			

**Policy on Assignments:**

Do NOT email me your assignments. I will not accept electronically-delivered assignments. You MUST print them out and hand me hard copies only.

**Policy on Late Assignments:**

Unless otherwise stipulated, assigned work is due in class on the day indicated in the course schedule. If you hand in work after class, but on the same day, you lose a half-letter grade. Each day an assignment is late, it accrues the loss of an entire letter grade. For example, an assignment handed in a day late can only get a *maximum* grade of a B. After an assignment is 3 days late, it is an automatic F. The end of the day is defined as 5:00 pm. You may email a **placeholder**, but a hard copy must be delivered by the following day; **if you email a placeholder, it must match the hard copy you turn in the next day, and if I never receive a hard copy, then you do not get credit for the assignment.** You may hand deliver to my lab/office (HSSB 1038) or put in my Anthro Mailbox in the Mailroom on the second floor of HSSB.

**Attendance/Participation Requirements:**

Class attendance is critical to understanding the course concepts and keeping up with the work load. Missing even one class can impact you negatively in terms of understanding the course material. If you must miss class, please arrange to borrow notes from a fellow classmate. You are welcome to come to my office hours to clarify concepts, but do not expect me to give you a private lesson on everything you missed by not attending class. Participation is also important. A good portion of the class will involve in-class exercises that allow you to apply the statistical concepts learned in lectures to real data sets.

**ATTENDANCE/PARTICIPATION = 10% of your grade**

There will be 7 graded **Lab Assignments (Labs 2-8)**. You will begin these assignments in the lab portion of the course (see course schedule), and they will usually be due a week after you begin them. The assignments will vary and must be written up and handed in individually – in other words, they are NOT group projects. You can, however, work with another classmate to figure out HOW to run the statistics. The *interpretation* of the results, however, MUST be conducted individually.

**TOTAL GRADED LABS (7) = 45% of your grade**

There will be 3 **Quizzes**. Each quiz will consist of 10-20 questions related to concepts covered in class: you will have an hour maximum to take the quiz. On the day that a quiz is scheduled, DO NOT be late; the quiz will be the first order of business, after which I will lecture or we will participate in a lab exercise (whichever the course schedule stipulates). You will not be expected to perform any mathematical computation for the quizzes – it will be concept based. The final quiz will be comprehensive, but with a bias towards that final two lecture topics.

**TOTAL QUIZ GRADE (3) = 45% of your grade**

**IV. Computer Lab Availability**

In addition to our class meetings, the computer lab (in which our class is held / SSMS 1303) has open access availability during selected times. This means you may use the lab to work on your assignments at these times without disturbing any classes. You may need extra time outside of class in order to complete your lab assignments. To find up-to-date information on when SSMS 1303 (or other computer labs) has open access, please visit the following website: <http://labschedule.collaborate.ucsb.edu/> You will need to go to the upper right part of the screen to a drop-down menu labeled “Request Event” and Choose “Collaborate” – this will get you to the computer labs!

## V. Course Schedule

DAY	DATE	TOPIC OF STUDY	CLASS FORMAT	READING	Due
Mon	Oct 1	Introductions		Chapters 1 & 2	
Mon	Oct 8	Variables & Measurement; Central Tendency & Visual Display	Lecture / Labs 1 & 2	Chapters 3 and 4	
Mon	Oct 15	Normal Curve & Standardizing Data	Lecture / Lab 3	Chapters 5 and 6	Lab 2 Due
Mon	Oct 22	<b>QUIZ 1</b> , then Measures of Association / Correlation	Quiz / Lecture / Lab 4	Chapter 12; Cowgill article	Lab 3 Due
Mon	Oct 29	Predicting Relationships / Linear Regression	Lecture / Lab 5	Chapter 11	Lab 4 Due
Mon	Nov 5	Sampling Strategies and Sample Diversity	Lecture / Lab 6	Chapter 16, Kintigh Articles	Lab 5 Due
Mon	Nov 12	<b>NO CLASS / Veteran's Day</b>			
Mon	Nov 19	<b>QUIZ 2</b> , then Tests of Significance	Quiz / Lecture / Lab 7	Chapters 7, 8, 13	Lab 6 Due
Mon	Nov 26	Factor Analysis – Correspondence Analysis and Principal Components Analysis	Lecture / Lab 8	Chapter 15; Baxter Article	Lab 7 Due
Mon	Dec 3	<b>QUIZ 3 comprehensive with emphasis on Significance tests and Factor Analysis</b> , then instructor evaluations	Quiz / Evals		Lab 8 Due