The main goal of this course is to give anthropology graduate students from all subfields and those in related social sciences the ability to conduct basic quantitative and statistical analyses. It is also my hope that I might convince anyone who is unfamiliar or even fearful of this approach to research that statistics are not ‘rubbish’ and worth learning about. I hope you will find that learning ‘statistics’ is quite different than ‘math’ and you don’t have to know much more than basic algebra to be able to understand and use basic statistics. This is especially true now that computers do most of the heavy lifting, and this is good because it allows anthropologists to do what we do best -- ask interesting questions about the world and try to answer them, in this case using numbers.

Whether you are a budding academic or an applied social scientist, some aptitude with statistics will make reading academic literature more accessible and increase your job prospects. If you are pursuing a Ph.D. in sociocultural anthropology conducting simple households surveys and collecting descriptive statistics can be an invaluable way to learn the ‘lay of the land’ upon entering the field and a way to begin building rapport in small communities before researching sensitive topics. Archaeology and paleoanthropology abound with numerical data, and for those interested in public policy, robust statistical analyses are strong arguments for change. As you progress from graduate school to jobs in academics, government, or the non-profit world, data abound and qualified analysts are in demand. This course will provide you with a basic foundation in quantitative and statistical analysis.

The course combines lectures, a hands-on laboratory to learn how to conduct analyses, homework assignments, and exams to help students learn the concepts and methods underlying the use of quantitative and statistical approaches in anthropology. Additional
readings and datasets will become available throughout the semester on the course website.

**Laboratory and Optional Readings**

Labs will be taught with “R” the most powerful and popular open-source (read: *free*) software program for statistical analysis. After each in-class lab session, you are expected to print out and hand in your results. These will be graded for completion and as part of “class participation.” Basic computer skills are important but there are no computational or mathematical prerequisites for the course. All necessary computer hardware and software to complete the course will be available in the computer lab; however students are also encouraged to configure their personal computers or laptops with the course software. For those who are interested in a deeper appreciation of R, I suggest purchasing the optional book (Gardner) and if there is interest, I will suggest optional readings in it throughout the semester.

**A final note**

Finally, I would like to acknowledge that for graduate students in the Anthropology Department this is a required course and not everyone will take it with a burning desire to learn statistics. Some may even fear it. Don’t! My goal is to make statistics accessible and useful and I will do my best to help you, whatever your aptitude at the beginning. If you find yourself frustrated with the computer or the basic arithmetic and algebra, please come to my office hours and I will try to help you through it. But it is critical that you put in the effort to keep up...falling behind in a cumulative course such as this is a recipe for trouble.

**Textbook(s)**


## Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Points (Percentage)</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>100 pts. (20% of final grade)</td>
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<tr>
<td>Exam 2</td>
<td>100 pts. (20%)</td>
</tr>
<tr>
<td>Final Quantitative Analysis Paper</td>
<td>100 pts. (30%; 40% for ANTH498R)</td>
</tr>
<tr>
<td>Project Drafts (Three)</td>
<td>10 pts. each (3.3% each)</td>
</tr>
<tr>
<td>Presentation</td>
<td>10 pts. (10%; optional for ANTH498R)</td>
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<tr>
<td>Participation/Lab completion</td>
<td>10 pts. (10%)</td>
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## Undergraduates

This course is open to advanced undergraduates and is cross-listed as ANTH 498R. If you are interested in this course, please contact me in advance and we will discuss whether the course is suitable for you. Undergraduate requirements are slightly different than above: the final paper length target is 4pp (single space) and it is worth 40% of the final grade; the presentation is optional.

## Class Schedule

### Part 1: The role of statistics in Anthropology; working with quantitative data; R

**Lecture No. and Dates**

1. **Jan 23**  
   *Topics*: Introduction and course overview, quantitative analysis and statistics in Anth.  
   *Reading*: Statistical Thinking (Preface, pp. xxviii-xxix)

2. **Jan 30**  
   *Topics*: Displaying distributions with figures, Using R-Commander  
   *Reading*: C 1; Fox, J. (2012) Getting started with R-Commander.  
   **NY Times** (2009) “Data Analysts Captivated by R’s Power”  
   **Optional**: Install R and R-Commander software.  
   [http://socserv.mcmaster.ca/jfox/Misc/Rcmdr/installation-notes.html](http://socserv.mcmaster.ca/jfox/Misc/Rcmdr/installation-notes.html)

3. **Feb 6**  
   *Topics*: Describing describing distributions with numbers (summary statistics); The “Normal” Distributions  
   *Reading*: C 2-3; additional materials on ELMS

4. **Feb 13**  
   *Topics*: Scatterplots, correlation  
   *Reading*: C 4; additional materials on ELMS
5. Feb 20  
**Topics:** Least-squares regression, multiple regression  
*Reading:* C 5; C 28 on ELMS; ; additional materials on ELMS  
**Homework due:** Proposal for final project topic

6. Feb 27  
**Topics:** Categorical data  
*Reading:* Ch 6; additional materials on ELMS

7. Mar 6  
**Topics:** Quantitative Research Design in Anthropology  
*Readings:* C 8; C 9 is recommended but not required); additional materials on ELMS

8. Mar 13  
**In-class Exam #1**  
(Chapters 7 and relevant parts of 17 may be a useful study guide)  
**Homework due:** Draft of Methods, Materials, and Approach

March 18-22  
**Spring Break**

Part 2: Basic probability; Inference; Relationships between variables; Stating and testing hypotheses

9. Mar 27  
**Topics:** Introduction to Probability  
*Reading:* C 10-11; additional materials on ELMS

10. Apr 3  
**Topics:** Confidence Intervals and Tests of Significance  
*Reading:* C 14-15; additional materials on ELMS

11. Apr 10  
**Topics:** Inference  
*Reading:* C 16 & 18; additional materials on ELMS  
**Homework due:** Final project preliminary results from two statistical tests.

12. Apr 17  
**Topics:** Analyses of Differences, T-test, Chi-Square test  
*Reading:* C 19 & 23; additional materials on ELMS

13. Apr 24  
**Topics:** Analyzing differences with ANOVA (ANalysis Of VAriance)  
*Reading:* C 25; additional materials on ELMS

14. May 1  
**Final Quantitative Analysis Presentation**

15. May 8  
**In-class Exam #2**

16. May 15  
(EXAM WEEK) **Final Quantitative Analysis Paper due by 5 PM**
Research Project

The final project will involve identifying an anthropological dataset suitable for quantitative analysis and conducting at least five statistical tests of your choice. You will then compose a research report describing the data and your chosen analyses. Please try to provide a cohesive analysis; in other words, I strongly recommend running *more than* five tests and then selecting the ones that complement each other in a compelling way. The focus of this project should be figures and statistics, so you will need to write concisely, if not tersely. To this end, all tables and figures should be included at the end of the report (no page limit), and referenced in the text (which is limited to five [5] single-spaced pages). Here is a general outline:

1. Introduction/Background -- describe the research question(s) and brief theoretical background.
2. Materials and methods -- describe the data and how it was collected (by you or the original researcher if you are using a published dataset); why are these data appropriate for your research questions(s)? It is appropriate to include descriptive statistics, plot distributions, and justify data transformations in this section.
3. Approach -- Outline in general terms the analysis in the next section. For each research question (from #1) you should provide a problem statement, hypothesis and null hypothesis, and prediction (E.g., “If theory X is correct, the data will show pattern Y...”). Your statistical results will then ‘test’ your prediction(s). If you have multiple research questions, please use subsections to separate them.
4. Results -- E.g., “The results of a one-way ANOVA are presented in Table 1...” In this section present the results of each statistical analysis, in some detail and with clarification. Help the reader (me in this case) understand the analysis by explaining the statistics you are including (this is where you prove you understand the material).
5. Interpretation -- Interpret what the statistical results suggest about the main research question(s). Can you reject the null hypothesis?
6. Conclusion -- What have we learned from your analysis? (It’s ok to have negative results).

To help you develop your projects in a timely manner (and end-of-semester freak-outs), I would like to see evidence of progress throughout the semester. By the following dates I require brief (~1-2 pp) assignments to be submitted.

Research question(s), possible datasets and variables to be analyzed. (Feb.13)

Final dataset, overall statistical approach, and five appropriate statistical tests. (Mar. 13)

Preliminary results from two statistical tests. (April 10)
A final presentation of your statistical analyses is due on May 1 and the final quantitative analysis paper, including results from all five tests, is due on May 15 by 8:45 PM.

Please use APA format for your bibliography.

**Proper Citation and plagiarism**

Plagiarism of any kind will not be tolerated and will result in a failing grade for the course. Provide citations for everything. Credit directly quoted and paraphrased words of others as well as sources of information. This includes internet sources as well.

If you have any questions about proper citation, please refer to the library help page or ask me:  
http://www.lib.umd.edu/ues/guides/citation-tools

The UMD Code of Academic Integrity can be viewed online  
http://www.president.umd.edu/policies/iii100a.html

**Incompletes**

Incompletes should be reserved for extreme emergencies that prevent the completion of course assignments toward the end of a school semester. It is very difficult to make up course assignments from a previous semester once a new semester begins, and students are often not able to prevent an Incomplete grade from lapsing into an F before the assigned deadline. If you think it is necessary to apply for an Incomplete grade due to an end of semester emergency, please contact the instructor immediately to arrange for a new submission date for the incomplete work and to fill out the proper paperwork. The instructor reserves the right to refuse an Incomplete grade to any student.

**Late assignments**

Late assignments will only be accepted under extreme circumstances, and if accepted, points may be deducted depending on the circumstances. Always alert the instructor ahead of time if you think that you may not be able to submit an assignment on time.

**Special Needs**

If any student has any special study or test-taking needs (e.g., test anxiety, dyslexia, poor vision or hearing, special seating requirements, etc.), please let me know as soon as possible so that we can make your participation in this course a rewarding one. In addition, I will make students aware of special services/facilities on this campus that might be of assistance in the course of your studies here at UMCP including Disability
Support Services (http://www.counseling.umd.edu/DSS/) and the University Counseling Center (http://counseling.umd.edu).

Religious Observance

Effort will be made to avoid scheduling assignments with major religious holidays. However, it is the student's responsibility to inform the instructor of any intended absences for religious observances other than those listed on the UMD website in advance (http://www.faculty.umd.edu/teach/attend_student.html#religious). Prior notification is especially important in connection with final examinations.

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