

Applied Statistics in Biological Anthropology

TIME: M periods 8-10

PLACE: TUR 1208H

INSTRUCTOR: David Daegling, B376 Turlington Hall (352) 294-7603
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Office Hours: MF 10:30 – 11:30 AM; W 1:00 – 2:00.

COURSE OBJECTIVES: This course provides a practical, problem-based approach to data analysis in the field of biological anthropology. Primary objectives include learning skills for informed application of parametric, nonparametric and resampling approaches to statistical inference, as well as an understanding of effective communication of quantitative data. *A basic familiarity with statistics is assumed.* There is no specific textbook for the course, but we will review papers in the primary literature as exemplars of statistical application (or misapplication) for some topics. We will use the open-source platform **R** for statistical analyses. You may wish to consult some of the many published and online resources for **R** to familiarize yourself with its applications, including the recommended readings from e-books by Dalgaard and Zuur (available free through UF Libraries). Emphasis is on statistical applications to research problems rather than statistical theory.

STUDENT LEARNING OUTCOMES: Successful completion of the course will provide students with the following skills:

- Competence in the operation of **R**
- Determination of distributional properties of data
- Graphic presentation of quantitative data
- Parametric and nonparametric statistical applications
- Resampling statistical applications
- Hypothesis specification
- Selection of appropriate statistical procedures
- Diagnosis of validity of statistical inferences

COURSE REQUIREMENTS: Grading criteria for the course include timely and correct completion of homework assignments (80%), attendance and participation (10%) and a take-home final exam (10%). For some problems and the final exam you will be given unique datasets to analyze and interpret.

OTHER POLICIES: Late assignments get zero credit unless prior arrangement with the instructor has been made. Cell phones and pagers must be off during class. Academic dishonesty in any form will not be tolerated and is subject to university policy (University of Florida Rules - 6C1-4 Student Affairs), which includes provisions for expulsion from the university. Students requesting classroom accommodation

must first register with the Dean of Students Office (DSO). The DSO will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Students experiencing personal problems that are interfering with their academic performance are encouraged to contact the University Counseling Center (301 Peabody Hall, 392-1575), Student Mental Health (Student Health Care Center, 392-1171), or Sexual Assault Recovery Services (Student Health Care Center, 392-1161).

COURSE ADMINISTRATION: Syllabi, assignments, datasets, resources, and readings will be distributed through the CANVAS platform in e-learning: <http://lss.at.ufl.edu/> .

COURSE SCHEDULE (open dates are devoted to review of problem sets, script troubleshooting, and discussion of readings)

Week		Topic	Reading
1	(8/26)	Navigating R Probability	Dalgaard Chapter 1; Zuur Chapters 2, 3 Dalgaard Chapter 3; Cheng & Pitt 2003
2	(9/9)	Structure of ANOVA	Dalgaard Chapters 5, 7 (through 7.2) Conover and Iman 1981
3	(9/16)	Resampling methods	Lee 2001; Zuur Chapter 6
4	(9/23)	Covariation	Rodgers & Nicewander 1988
5	(9/30)	Factorial and nested designs	Dalgaard Chapters 7 (through 7.6), 12 (12.6) Conover and Iman 1981
6	(10/7)	Regression models	Dalgaard Chapter 6; Foley 1991
7	(10/14)	ANCOVA	Dalgaard Chapter 12 (12.7), Grant et al 1992
8	(10/21)	Multiple regression	Dalgaard Chapter 11, 13; Dunbar & Schultz 2007
9	(10/28)	Analysis of frequencies	Dalgaard Chapters 8, 13
10	(11/4)	Autocorrelation Circular distributions	Bivand Chapter 9 Griffin & Richmond 2009
11	(11/18)	Discriminant functions, PCA	Corruccini 1975, Fleagle & Reed 1996
12	(11/25)	Bayesian inference	Gowland and Chamberlain 2002
13	(12/2)	Modeling process Statistical risk management	Taleb 2007