ANG 4930/6930, Sections 2B80,2B90 Spring 2022

Applied Statistics in Biological Anthropology

TIME: M periods 9-11

PLACE: TUR 1208H

INSTRUCTOR: David Daegling, B376 Turlington Hall (352) 294-7603
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Office Hours: M 10:00 – 11:00 AM; W 1:00 – 3:00 PM.

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 resampling approaches to statistical inference and for effective communication of quantitative data. Statistical concepts and theory are developed through numerical simulations to provide an intuitive approach to probabilistic thinking.

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).

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

- Competence in the operation of ***R***
- Resampling statistical applications
- Graphic presentation of quantitative data
- Parametric and nonparametric 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 (after Week 1 portions of class time will be devoted to review of problem sets and troubleshooting coding issues, as well as exploration of topics introduced in course readings)

Week		Topic	Reading
1	(1/10)	Navigating R The meaning of chance	Dalgaard Chapter 1; Zuur Chapters 2, 3
2	(1/24)	Probability distributions	Dalgaard Chapter 3; Cheng & Pitt 2003
3	(1/31)	Structure of ANOVA	Dalgaard Chapters 5, 7 (through 7.2) Conover and Iman 1981
4	(2/7)	Resampling methods	Lee 2001; Zuur Chapter 6
5	(2/14)	Covariation Regression models	Rodgers & Nicewander 1988 Dalgaard Chapter 6; Foley 1991
6	(2/21)	Factorial and nested designs	Dalgaard Chapters 7 (through 7.6), 12 (12.6) Conover and Iman 1981
7	(2/28)	ANCOVA	Dalgaard Chapter 12 (12.7), Grant et al 1992
8	(3/14)	Analysis of frequencies	Dalgaard Chapters 8, 13
9	(3/21)	Simulation exercise	Potts 1996, Grove 2011
10	(3/28)	Multiple regression Generalized linear models	Dalgaard Chapters 11, 13 Dunbar & Schultz 2007
11	(4/4)	Autocorrelation Circular distributions	Bivand Chapter 9 Griffin & Richmond 2009
12	(4/11)	Discriminant functions, PCA	Corruccini 1975, Fleagle & Reed 1996
13	(4/18)	Bayesian inference Statistical risk management	Gowland and Chamberlain 2002 Taleb 2007