

COURSE SYLLABUS

INSTRUCTOR: Alan Agresti

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OFFICE HOURS: Tuesday and Thursday 2-3:45, and by appointment

TEACHING ASSISTANT: Dhiman Bhadra, email dbhadra@stat.ufl.edu, office MWF 1-3 pm, and by appt., McCarty C 428

COURSE OBJECTIVES: This course applies statistical methods developed in STA 6126 to model building in multi-variable problems. The main topics studied are multiple regression (for quantitative responses and predictors), analysis of variance and covariance (for quantitative responses with at least some categorical predictors), model-building and checking methods, and logistic regression (for categorical responses).

COURSE POLICY:

Textbook: *Statistical Methods for the Social Sciences*, 3rd ed., Prentice Hall, by A. Agresti and B. Finlay, 1997 (Chapters 11-15). I may also e-mail you drafts of chapters for the 4th edition (2008).

Exams: Three exams, each of which contribute to 1/4 of the final grade. The other 1/4 is based on homework.

Homework: I plan to send you a set of problems by e-mail for each chapter. These will be taken partly from an upcoming new edition of the text and partly from the 3rd edition. Many exercises require statistical software. You can use whatever software you and/or your department prefer, but the class examples use SPSS. For help with software, see or e-mail the TA, Dhiman Bhadra. See also the discussion of the use of SPSS at the course website. Collaborative work is encouraged, but you must write up your solutions independently. Short solutions will also be made available. I will ask you to hand in the file of your solutions about one week after I finish each of the four major course topics. The TA will look these over, and each will be worth 25 points (100 total for the 4 homeworks).

Websites: Course website is www.stat.ufl.edu/~aa/sta6127/index.html

Text website for datasets is www.stat.ufl.edu/~aa/social/data.html

TENTATIVE EXAM DATES:

Exam 1 Thursday, February 15

Exam 2 Thursday, March 29

Exam 3 Tuesday May 1, 10-12 am; makeup Wed. May 2, 8-10 pm

SUPPLEMENTAL REFERENCES:

Demaris, A. (2004) *Regression with Social Data*, Wiley.

Kutner, M., Nachtsheim, C. J., and Neter, J. (2004) *Applied Linear Regression Models*, 4th ed. McGraw Hill.

Agresti, A. (2007) *An Introduction to Categorical Data Analysis*, 2nd ed., Wiley.

OUTLINE OF TOPICS:

1. Multiple Regression Modelling

Multiple regression model
Multiple correlation and R-squared
Inference for multiple regression coefficients
Modeling interaction
Comparing regression models
Partial correlation
Standardized regression coefficients

2. Comparing Groups: Analysis of Variance and Covariance Methods

1-way ANOVA
Multiple comparisons of means
ANOVA and dummy variables in regression
2-way ANOVA and regression
Analysis of covariance models
Adjusted means

3. Model Building with Multiple Regression

Model selection procedures
Regression diagnostics
Multicollinearity
Generalized linear models
Nonlinearity: Polynomial regression
Nonlinearity: Exponential regression

4. Modeling Categorical Responses: Logistic Regression

Logistic regression
Inference for logistic regression
Logistic models for ordinal responses
Logistic models for nominal responses