College of Public Health & Health Professions

PHC 6050C: Biostatistical Methods I
Fall 2014
Mondays 1:55pm – 2:45pm, HPNP Room G105
Wednesdays 1:55pm – 3:50pm, HPNP Room G110
November 19, HPNP Room G210
Course Website: lss.at.ufl.edu

Instructor Information

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Course Overview

This is the first course of a two-course sequence with the purpose of providing students with the fundamentals of biostatistical data analysis. This first course covers data analysis using linear models, focusing on the theory and practice of regression and analysis of variance. Students will learn to use the statistical package R for data analysis.

Prerequisites

Basic knowledge of data analysis, linear algebra, and calculus III, and permission of the instructor. Students must own a laptop that can run the statistical package R, which is freely available at http://cran.r-project.org/.

Course Objectives and/or Goals

Upon successful completion of the course, students will be able to:

- Formulate a statistical problem in terms of a linear regression model in a way that meets the goals of a collaborating health scientist
- Interpret the basic theory of estimation and inference in linear models
- Apply and interpret diagnostic checks on the model
- Apply and interpret methods for overcoming violations in basic model assumptions, including generalized least squares and transformation

- Apply and interpret methods for model choice, including variable selection, shrinkage methods, and model uncertainty
- Be familiar with problems associated with missing data
- Apply and interpret analysis of variance methods and designs
- Interpret statistical analyses while remaining aware of limitations.

Course Materials

Required text: *Linear Models with R* (2005), by Julian J. Faraway. Chapman & Hall, Boca Raton, Florida. ISBN: 1-58488-425-8.

Course Requirements/Evaluation/Grading

Students are responsible for all course material, including reading required materials prior to each class. Failure to complete assignments will result in a failing grade.

The assessment will include class participation, assignments, and two exams. Class participation will include weekly attendance, and leading and participation in discussions. Students can discuss in groups on homework assignments, but each assignment should be completed on one's own, without copying work from other students and sources.

Class participation: 20%
Homework: 40%
Exam 1 (mid-semester): 20%
Exam 2 (final day of classes): 20%

The grading scale for this course consists of the standard scale, including minus grades, below. The conversion factors for grade point values that are assigned to each grade are also included (in parentheses):

93% - 100% = A (4.00)
90% - 92% = A- (3.67)
87% - 89% = B+ (3.33)
83% - 86% = B (3.00)
80% - 82% = B- (2.67)
77% - 79% = C+ (2.33)
73% - 76% = C (2.00)
70% - 72% = C- (1.67)
67% - 69% = D+ (1.33)
63% - 66% = D (1.00)
60% - 62% = D- (0.67)
Below 60% = E (0.00)

Weekly Outline

Week	Date	Topic(s)	Textbook Chapter(s)
1	Aug -25 Aug -27	Introduction Estimation	1; Appendix A, B 2
2	Sep-1 Sep-3	No Class (Labor Day) Estimation	 2
3	Sep-8 Sep-10	Estimation Inference	2 3
4	Sep-15 Sep-17	Inference	3
5	Sep-22 Sep-24	Diagnostics	4
6	Sep-29 Oct-1	Problems with the Predictors	5
7	Oct-6 Oct-8	Problems with the Error	6
8	Oct-13 Oct-15	Review First Exam	
9	Oct-20 Oct-22	Transformation Variable Selection	7 8
10	Oct-27 Oct-29	Shrinkage Methods	9
11	 Nov-3 Nov-5	Statistical Strategy and Model Uncertainty; Insurance Redlining; Missing Data; Analysis of Covariance	 10,11,12 13
12	Nov-10 Nov-12	One-Way Analysis of Variance	14
13	Nov-17 Nov-19	Factorial Designs	15
14	Nov-24 Nov-26	Block Designs No Class (Thanksgiving)	16
15	Dec-1	Block Designs	16
	Dec-3	Review	
16	Dec-8		
	Dec-10	Second Exam	

Statement of University's Honesty Policy (cheating and use of copyrighted materials)

Academic Integrity – Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details: **www.dso.ufl.edu/judicial/procedures/academicguide.php**).

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

We, the members of the University of Florida community,
pledge to hold ourselves and our peers to the
highest standards of honesty and integrity.

Policy Related to Class Attendance and Late or Missed Assignments:

Attendance of all class sessions is required. Failure to attend these classes may result in a failing grade or an incomplete. Please see the instructor as early as possible regarding possible absences. All assignments need to be handed in on time. Grading will penalize late assignments. Missed assignments will receive a zero score. Personal issues with respect to class attendance or fulfillment of course requirements (assignments, final presentation, class discussion) will be handled on an individual basis.

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (http://oss.ufl.edu/). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework. We all learn differently: however, if you have experienced problems in university classes with writing, in-class exams, understanding or concentrating in class; please talk to us or access a learning or education testing resource at the University or in another professional setting.

Counseling and Student Health

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information: http://www.counsel.ufl.edu/ or http://www.health.ufl.edu/shcc/smhs/index.htm#urgent

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: www.health.ufl.edu/shcc

Crisis intervention is always available 24/7 from:
Alachua County Crisis Center: (352) 264-6789.

BUT – *Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance*.

Class Demeanor Expected by the Professor (late to class, cell phones) :

Students are expected to show up for class prepared and on time. Cell phones are to be silenced during class unless there is an emergency, in which case please inform the instructor.

Acknowledgement

Thanks to Dr. Yueh-Yun Chi for sharing the class notes and R codes of the course.