

PHC 6053 Regression Methods for the Health and Life Sciences Spring 2009

Instructor

Ning Li, Ph.D.

Assistant Professor, Department of Epidemiology and Biostatistics

College of Public Health and Health Professions

HPNP 3115

Phone: 273-5822

Email: nli@phhp.ufl.edu

Class hours: Monday 8:30-9:20am, G312 HPNP; Wednesday 8:30-10:25am, 1102 HPNP.

Office hours: Monday 9:30 am to 11:30 am and by appointment.

Course web (E-Learning)

E-learning is accessible at lss.at.ufl.edu or through my.ufl.edu. You must have a valid Gatorlink ID and password. For assistance, call the UF Help Desk at 392-HELP. Students will need to log onto E-Learning and print all electronic files before each class except the first class. If materials are not posted, we will provide the hardcopies in class. Students are required reading these materials prior to each class.

Course Description

This course introduces graduate students in fields other than statistics to a wide range of modern regression methods. Emphasis is on modeling driven by actual data from studies in a variety of areas, primarily from health, biology, and ecology. The primary topics are multiple linear regression, logistic regression, and Poisson regression. A main goal is to learn what approach to use among the linear and nonlinear models, and how to determine if the fit is adequate. By the end of the course, students will achieve competency in carrying out the analyses in SAS.

Course Objectives

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

1. Select appropriate methods for specific data, especially in determining whether a linear or a nonlinear approach to regression is appropriate
2. Use statistical software for performing regression analysis in the SAS language
3. Test and interpret linear models for continuous outcome data (normal linear model)
4. Test and interpret models for categorical outcome data (logistic and Poisson regression)
5. Draw appropriate conclusions for both randomized designed experiments and observational studies
6. Communicate clearly to subject matter experts the purposes and results of complex statistical analysis, both orally and in writing.

Prerequisite

STA6166 or an equivalent course. Some familiarity with SAS.

Required Textbook

Vittinghoff, Glidden, Shiboski, and McCulloch (2004): *Regression methods in Biostatistics*, Springer. Book website: <http://www.biostat.ucsf.edu/vgsm>

Optional

Kutner, Nachtsheim, Neter, and Li (2005): *Applied linear statistical models*, 5th edition, McGraw-Hill.

Easy SAS book:

Applied Statistics and the SAS Programming Language (5th edition) by Ronald P. Cody and Jeffrey K. Smith (Paperback – Mar 2005)

The Little SAS Book: A Primer (3rd edition) by Lora D. Delwiche and Susan J. Slaughter (Paperback – Nov 2003)

Statistical Software (required)

All students should have access to a laptop with SAS installed. You will also have exams using your laptop. SAS version 9.1 will be used by the instructor. See <http://software.ufl.edu/sas/> for SAS program purchase and online documents. If you are registered as a student in an approved program at the University of Florida, you can get a CD of the SAS system and a one-year user's license from UF bookstore (392-0194). You may have to collect this in person. I will spend around one hour on SAS programming every week. Please remember to bring the laptop to class every *Wednesday*.

Grading

Homework assignments (25%), exam I (30%), exam II (30%), and a term project (15%). SAS skills will be a *very* important part of your grade. To obtain full points in the exams, homework assignments and the term project, students are required to show how he/she gets the final answer. *Points will be given only for good reasoning.*

Grading scale:

90.0% - 100% = A

85.0% -89.9% = B+

80.0% -84.9% = B

75.0% -79.9% = C+

70.0% -74.9% = C

65.0% -69.9% = D+

60.0% -64.9% = D

Below 59.9% = E

Homework assignments

Late homework will not be accepted. When computer analyses are due, please submit a complete write-up of the assignment and the SAS code used to analyze the data.

Exams

Each exam will have two parts: SAS programming exam and written exam.

Term project

It is going to be a team project by a group of 2 -3 students. Students are responsible to find their own data. The proposal (outline description) for this project will be due about a month before the last day of class. The term project should be a complete analysis of a dataset. Students are required to turn in a final report, which should include tables and figures in the main texts and documented

SAS code in the appendix. The grade for the project will depend on presentation of the logic flow and the correctness and adequacy of the analysis.

Class attendance

All students are required to attend all classes.

Policy on make-up work

Students are allowed to make up work ONLY as the result of illness or other unanticipated circumstances warranting a medical excuse and resulting in the student missing a homework or project deadline, consistent with College policy. Documentation from a health care provider is required. Work missed for any other reason will receive a grade of zero.

Academic Integrity

Each student is bound by the academic honesty guidelines of the University and the student conduct code printed in the Student Guide and on the University website. The Honor Code states: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" Cheating or plagiarism in any form is unacceptable and inexcusable behavior.

Accommodations for Students with Disabilities

Students requiring accommodations must first register with the Dean of Students' Office. The Dean of Students' Office will provide documentation to the student who must then provide this documentation to the faculty member 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 me or access a learning or education testing resource at the University or in another professional setting. For your assistance, should you need them, please consider either of the following:

University Counseling Services

<http://www.counsel.ufl.edu/base.asp?include=counselingServices.inc>

P301 Peabody Hall – 392-1575

Student Mental Health Services in the Student Health Care Center

<http://www.health.ufl.edu/shcc>

Room 245, Infirmary Bldg.- 392-1171

PHC 6053 Course Schedule

Week	Topic	Reading	
1, 2	Exploratory and Descriptive Methods	Ch 2	
2, 3	Simple Linear Regression	Ch 1, 3.3	
4	Multiple Linear Regression I: some basics	Ch 4.1 – 4.3	
5	Multiple Linear Regression II: confounding, mediation and interaction	Ch 4.4 – 4.6	
6	Building the Regression Model I: model diagnostics	Ch 4.7	
7	Building the Regression Model II: model selection	Ch 5	
8	Review		
9	Exam I (SAS exam and written exam)		
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Spring Break			
11	Logistic Regression I: contingency tables and simple logistic regression	Ch 3.4, 6.1	
12	Logistic Regression II: multiple logistic regression	Ch 6.2	
13	Logistic Regression III: diagnostics and model selection	Ch 6.4	
14	Poisson Regression	Ch 9	
15	Review		
16	Exam II (SAS exam and written exam)		

Schedule for exams and project

Exam I: March 2nd and 4th (Monday 1 hour SAS exam, Wednesday 2 hours written exam)

Exam II: April 20th and 22th (Monday 1 hour SAS exam, Wednesday 2 hours written exam)

Project proposal is due on March 23rd

Project manuscript is due on April 22nd