College of Public Health & Health Professions
Course Syllabus

PHC 7091: Advanced Biostatistical Methods II
Spring 2019
Tuesdays 9:35 AM – 10:25 AM, Room CTRB 5235
Thursdays 9:35 AM – 11:30 AM, Room CTRB 5235
Course Website: http://elearning.ufl.edu/

Instructor Information

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Departmental Course Contact:
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Course Overview
This is the second course of a two-course sequence with the purpose of providing students with advanced knowledge and practice of general regression models for independent and dependent outcomes. Students will learn generalized linear model regression methods and generalized linear mixed model regression methods. Bayesian and Frequentist inference will be covered. Students will be expected to use learn to use the statistical packages R for data analysis.

Prerequisites
Advanced Biostatistical Methods I, or 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 should be able to:
- Formulate a statistical problem in terms of a Frequentist or Bayesian generalized linear or generalized linear mixed model in a way that meets the goals of a collaborating health scientist
- Apply and interpret generalized linear and generalized linear mixed models.
- Describe and interpret the advanced theory of generalized linear and generalized linear mixed models.
- Interpret statistical analyses while remaining aware of limitations.

Course Materials

Required text: *An Introduction to Generalized Linear Models (Texts in Statistical Science)*, Third Edition, by Annette J. Dobson and Adrian G. Barnett. CRC Press (Taylor and Francis Group). ISBN: 1-58488-950-0, 978-1-58488-950-2

Reference Text:
[1] McCullagh, P. and Nelder, J.A., *Generalized Linear Models, 2nd Edition,* Chapman & Hall, London, 1989.
[2] McCulloch, C. E., and Searle, Shayle R., *Generalized, Linear, and Mixed Models,* John Wiley & Sons, New York, 2001.
 [3] Ramon Littell, Walter W. Stroup, and Rudolf Freund (2002). *SAS for Linear Models*. Wiley-SAS (Chapter on GLM).
[4] Faraway J (2006). *Extending the linear model with R: generalized linear, mixed effects and nonparametric regression models*, Chapman & Hall/CRC, Boca Raton,
[5] Hardin, Jame W., and Hilbe, Joseph M., *Generalized Estimating Equations,* Chapman & Hall, Boca Raton, 2003.

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, two quizzes and two exams. Class participation will include regular attendance and participation in assignment discussions.

Class participation: 10%
Quiz 1: 20%
Quiz 2: 20%
Exam 1 (mid-semester): 25%
Exam 2 (final day of classes): 25%

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):
Grading Scale

97-100% - A+	92-96% - A	90-91% - A-
88-89% - B+	82-87% - B	80-81% - B-

78-79% - C+	72-77% - C	70-71% - C-
	65-69% - D	

For greater detail on the meaning of letter grades and university policies related to them, see the Registrar's Grade Policy regulations at:
http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Critical Dates and Tentative Outline (***Please note that the teaching and exam schedules are tentative)

Class begins: Jan 8, 2019;
Withdrawal Deadline for all courses without a failing grade ONE.UF: April 7;
Last Class: April 23;
Holidays: Mar 5 and 7 (falls within Spring break)
January 31: Quiz 1; February 28: Exam 1; April 4: Quiz 2; April 23: EXAM 2due
(Take home Exam)

Class Session	Topics	Material to read
Week 1-2	Review of linear models, nonlinear models; General principle of model fitting and diagnostics; Introduction of GLM, Exponential family	Chapters1-3 (Dobson); Handouts
Jan 30, 2019	Quiz 1	
Week 3-5	Generalized linear models, Estimation, Inferences	Chapters 3-5 (Dobson); Chapter 3&4 (Hardin & Hilbe); Handouts
February 27, 2019	Exam 1	
Week 6-9	Software for GLM; Logistic and Poisson regression models; Gamma family, Inverse Gaussian family; Overdispersion issues. (Note: Student's assignments for lectures may be given here)	Chapters7-9 (Dobson); Handouts
March 6 and 8, 2019	Spring break	
April 24, 2019	Quiz 2	
Week 10-14	Quasi-likelihood function; GEE; Population-averaged GEE; Sandwich estimate; Missing data; Diagnostics; Software for GEE.	Chapter 11 (Dobson); Handouts
April 23, 2019	Exam 2 due	

Academic Integrity: Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. " You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."
It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code, the Graduate Student Handbook and these web sites for more details:
https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/

http://www.dso.ufl.edu/sccr/honorcodes/conductcode.php

http://www.dso.ufl.edu/studenthandbook/studentrights.php

http://gradschool.ufl.edu/students/introduction.html

Policy Related to Class Attendance and Late or Missed Assignments:

Attendance of all class sessions is required. 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://dss.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.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu.

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.
http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx

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.