

College of Public Health & Health Professions

Fall 2016

PHC 7090: Advanced Biostatistical Methods I

Room CTRB 5235

Tuesdays, Periods 3-4, 9:35am – 11:30am

Thursdays, Periods 4, 10:40am – 11:30am

**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 advanced knowledge and mathematical details on statistical inference and linear models. This first course covers Frequentist and Bayesian estimation and inference. It also encompasses estimation and inference for linear models, handling of missing data and modeling strategies. Students will learn to use the statistical package R and SAS for data analysis.

**Prerequisites**

Knowledge of linear and matrix algebra, calculus, and mathematical statistics is required. Permission of the instructor is needed if this requirement is not met. Students are expected to be familiar with the basic operations of R and SAS.

**Course Objectives and/or Goals**

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

- Apply the Frequentist approach to estimation and hypothesis testing,
- Implement Bayesian computation for statistical inference,
- Identify and contrast differences in Frequentist and Bayesian hypothesis testing,
- Formulate and interpret a linear model,
- Carry out Frequentist and Bayesian inference for linear models,
- Address missing data,

- Apply sound modeling strategies,
- Use SAS and R to fit a linear model.

### **Course Materials**

Required text: Bayesian and Frequentist Regression Methods (2013) by Jon Wakefield. Springer Series in Statistics.

Optional text: Regression Modeling Strategies: With Applications to Linear Models, Logistic and ordinal Regression, and Survival Analysis (2015) 2<sup>nd</sup> Edition, by Frank Harrell. Springer Series in Statistics.

### **Course Requirements/Evaluation/Grading**

The overall grade will include class participation, homework assignments and three exams. Students are encouraged to discuss either in groups or with the instructor on homework assignments, but are expected to complete homework on their own.

Class participation: 20%

Assignment: 20%

Exams: 60% (20% each)

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)

## Schedule

Wk	Date	Topic(s)	Chap
1	8/23	Introduction and Appendices	1
	8/25		
2	8/30	Frequentist Inference	2
	9/1		
3	9/6		
	9/8		
4	9/13		
	9/15	No Class	
5	9/20	Exam I	
	9/22	Review	
6	9/27	Bayesian Inference	3
	9/29		
7	10/4		
	10/6		
8	10/11		
	10/13		
9	10/18	Exam II	
	10/20	Review	
10	10/25	Linear Models	5
	10/27		
11	11/1		
	11/3		
12	11/8		
	11/10		
13	11/15	No class	
	11/17	Student Presentations	
14	11/22	Student Presentations	
	11/24	Thanksgiving (no class)	
15	11/29	Student Presentations	
	12/1	Review and Evaluation	
16	12/6	No class (Reading)	
	12/8	Exam III	

## **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](http://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. Personal issues with respect to class attendance or fulfillment of course requirements (e.g., reading, assignments, exams, 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 the instructor and to seek confidential assistance at the University of Florida Counseling and Wellness Center at 352-392-1575 or <http://www.counsel.ufl.edu/>.

The Student Health Care Center at Shands is located on the second floor of the Dental Tower(Room D2-49) in the Health Science Center. It and its satellite clinic, located in the J. Hillis Miller Health Science Center (Jacksonville), offer a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. For more information, contact the clinic at 352-294-5700 or check out the web site at: <http://shcc.ufl.edu/>.

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.