

University of Florida
College of Public Health & Health Professions Syllabus
PHC 6050c: Biostatistical Methods I (3 credit hours)

Fall: 2018

Delivery Format: Online and On-Campus

Course Website: <http://elearning.ufl.edu>

Instructor Name: Steven Foti, PhD
Room Number: CTRB 5227
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Email Address: fotisj@ufl.edu
Office Hours: R 10am-12pm, or by appointment
Teaching Assistants: none
Preferred Course Communications: email or Canvas message

Prerequisites

Basic knowledge of data analysis, linear algebra, calculus III, and permission of the instructor.

PURPOSE AND OUTCOME

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.

Course Objectives and/or Goals

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

- 1) Formulate a statistical problem in terms of a linear regression model in a way that meets the goals of a collaborating health scientist
- 2) Interpret the basic theory of estimation and inference in linear models
- 3) Apply and interpret diagnostic checks on the model
- 4) Apply and interpret methods for overcoming violations in basic model assumptions, including generalized least squares and transformation
- 5) Apply and interpret methods for model choice, including variable selection, shrinkage methods, and model uncertainty
- 6) Be familiar with problems associated with missing data
- 7) Apply and interpret analysis of variance methods and designs
- 8) Interpret statistical analyses while remaining aware of limitations

Instructional Methods

(Online) The main content delivery methods for this course will be online lecture videos that supplement, review, and expand on the required textbook readings for each week. Additionally, the course website will contain a variety of discussion boards that can be used for asking/answering questions and an occasional discussion assignment.

(On-Campus) The main content delivery methods for this course will be a combination of face-to-face lecture and online lecture videos that supplement, review, and expand on the required textbook readings for each week. Additionally, we will have a variety of group discussions in the classroom on certain topics and basic proofs.

DESCRIPTION OF COURSE CONTENT

Topical Outline/Course Schedule

Instructor reserves the right to modify the course schedule with advance notice provided to students.

	Dates	Topic	Lecture	Homework	Textbook Reading
Week 1	Aug. 24	Introduction	Lesson 1	HW 1	1; Appendix A
	Aug. 28				
Week 2	Aug. 31	Estimation	Lesson 2	HW 2	2
	Sept. 4				
Week 3	Sept. 7	Inference, Prediction & Explanation	Lesson 3	HW 3	3, 4, 5
	Sept. 11				
Week 4	Sept. 14	Diagnostics	Lesson 4	HW 4	6
	Sept. 18				
Week 5	Sept. 21	Problems with the Predictors	Lesson 5	HW 5	7
	Sept. 25				
Week 6	Sept. 28	Problems with the Errors	Lesson 6	HW 6	8
	Oct. 2				
Week 7	Oct. 5	Review I & First Exam	Review 1	Exam 1	None
	Oct. 9				
Week 8	Oct. 12	Transformation	Lesson 7	HW 7	9
	Oct. 16				
Week 9	Oct. 19	Model Selection	Lesson 8	None	10
	Oct. 23				
Week 10	Oct. 26	Shrinkage Methods	Lesson 9	HW 8	11
	Oct. 30				
Week 11	Nov. 2 (No Class)	Insurance Redlining and Missing Data	Lesson 10, 11	None	12, 13
	Nov. 6				
Week 12	Nov. 9	Categorical Predictors (ANCOVA & ANOVA)	Lesson 12, 13	None	14
	Nov. 13				
Week 13	Nov. 16	Factorial Design	Lesson 14	HW 9	15
	Nov. 20				
Week 14	Nov. 23 (No Class)	Multiple Comparisons and Block Design	Lesson 15, 16	HW 10	16, 17
	Nov. 27				
Week 15	Nov. 30	Review II	Review 2	None	None
	Dec. 4				
Week 16	Dec. 4	Second Exam	Exam 2		

Course Materials and Technology

The required textbook for this course is:

Linear Models with R Second Edition (2014), by Julian J. Faraway. Chapman & Hall, Boca Raton, Florida.
ISBN-13: 978-1439887332

This course will use Canvas, and eLearning website that can be accessed at <http://elearning.ufl.edu> to organize and disseminate information. Students must own a laptop that can run the statistical package R, which is freely available at <http://cran.r-project.org/>.

For technical support for this class, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

ACADMIC REQUIREMENTS AND GRADING

Assignments and Grading

Discussions 10%: Multiple times throughout the semester we will discuss certain concepts being covered in the course. These discussions will be led by a prompt that you are expected to interact with your classmates to respond to. These may occur in the classroom (On-Campus) or on Canvas discussion boards (Online or On-Campus). To remain engaged in the course and to foster a community of learners, participation in these discussions is required and will be graded.

Homework 30%: Homework will be assigned as designated on the course schedule (above) and may involve free-response questions with problems involving statistical theory or methods and questions that require you to code your solution in R. You may discuss these homework assignments with your classmates, but each submission should be entirely your own work without copying from other students or sources.

Exam 1 (mid-term) 30% and Exam 2 (final) 30%: Exams will cover material learned in the lectures before them. Statistics concepts naturally build on each other, so while the emphasis of each exam will be on the most recent material, you may need to rely on concepts learned early in the course to answer some questions. Exams will be timed (3 hour maximum) and will take place on the specified dates (On-Campus) or at a time during the week that you will be able to schedule through ProctorU (Online only).

Point system used:

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

Policy Related to Make Up Exams or Other Work

This course operates on a module-based schedule and involves discussions related to concepts on homework. Therefore, **late assignments or quizzes will not be accepted** without an official excused absence (see next section).

Any requests for make-ups due to technical issues **MUST** be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You **MUST** e-mail me within 24 hours of the technical difficulty if you wish to request a make-up.

Policy Related to Required Class Attendance

Since a large portion of this class involves group interaction and the completion of in-class activities, regular punctual attendance and participation is expected. After two unexcused absences, you will begin losing discussion points at a rate of 1% per absence up to a maximum of 10%.

Please note all faculty are bound by the UF policy for excused absences. For information regarding the UF Attendance Policy see the Registrar website for additional details:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior

All students are expected to remain actively engaged in lecture material and participate in class discussions. Out of respect for your peers, cell phones and off-topic use of laptops will not be tolerated. Not only will these distractions interfere with the student's ability to learn, but they will also interfere with the learning of their classmates.

Communications Guidelines

When communicating with classmates or the instructor, especially when using email messages or Canvas discussions, please be courteous and respectful to avoid hindering the learning community established by the course. For information on netiquette guidelines, go to <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

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 or the Graduate Student Website for additional details:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

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

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

Online Faculty Course Evaluation Process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations 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/results/>.

SUPPORT SERVICES

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class. The Dean of Students Office will provide documentation of accommodations to you, which you must then give to me as the instructor of the course to receive accommodations. Please make sure you provide this letter to me by the end of the second week of the course. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: <http://www.counseling.ufl.edu>. On line and in person assistance is available.
- You Matter We Care website: <http://www.umatter.ufl.edu/>. If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.
- 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. 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: <https://shcc.ufl.edu/>
- 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>

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.

Inclusive Learning Environment

Public health and health professions are based on the belief in human dignity and on respect for the individual. As we share our personal beliefs inside or outside of the classroom, it is always with the understanding that we value and respect diversity of background, experience, and opinion, where every individual feels valued. We believe in, and promote, openness and tolerance of differences in ethnicity and culture, and we respect differing personal, spiritual, religious and political values. We further believe that celebrating such diversity enriches the quality of the educational experiences we provide our students and enhances our own personal and professional relationships. We embrace The University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act." If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see your instructor or refer to the Office of Multicultural & Diversity Affairs website: www.multicultural.ufl.edu.