

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

Fall: 2023

Delivery Format: On-campus (03B8); Online (0003); Online (32HD)

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

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Instructor Name: Steven Foti, PhD  
Room Number (on-campus only): HPNP G109  
Meeting Times (campus only): T-Period 6 (12:50 PM - 1:40 PM), F- Period 6 - 7 (12:50 PM - 2:45 PM)  
Phone Number: 352-294-5922 (office)  
Email Address: [fotisj@ufl.edu](mailto:fotisj@ufl.edu)  
Office Hours: W 11am-1pm in CTRB 5244  
Teaching Assistants: TBD, Canvas Inbox  
Preferred Course Communications: email, Canvas message

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### **Prerequisites**

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

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## **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, there will be opportunities to practice and explore the concepts covered in lecture within the Canvas modules.

(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 and coding activities 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	Content	Homework	Textbook Reading
<b>Week 1</b>	Aug. 25	Introduction	Module 1	HW 1	1; Appendix A
<b>Week 2</b>	Aug. 29	Estimation	Module 2	HW 2	2
<b>Week 3</b>	Sept. 5	Inference, Prediction & Explanation	Module 3	HW 3	3, 4, 5
<b>Week 4</b>	Sept. 12	Diagnostics	Module 4	HW 4	6
<b>Week 5</b>	Sept. 19	Problems with the Predictors	Module 5	HW 5	7
<b>Week 6</b>	Sept. 26	Problems with the Errors	Module 6	HW 6	8
<b>Week 7</b>	Oct. 3	Review I & First Exam	Review 1	Exam 1	None
<b>Week 8</b>	Oct. 10	Transformation	Module 7	HW 7	9
<b>Week 9</b>	Oct. 17	Model Selection	Module 8	None	10
<b>Week 10</b>	Oct. 24	Shrinkage Methods	Module 9	HW 8	11
<b>Week 11</b>	Oct. 31	Insurance Redlining and Missing Data	Modules 10, 11	None	12, 13
<b>Week 12</b>	Nov. 7	Categorical Predictors (ANCOVA & ANOVA)	Modules 12, 13	None	14
<b>Week 13</b>	Nov. 14	Factorial Design	Module 14	HW 9	15
<b>Week 14</b>	Nov. 21	Multiple Comparisons	Modules 15	None	16
<b>Week 15</b>	Nov. 28	Block Design	Module 16	HW10	17
<b>Week 16</b>	Dec. 5	Review II	Review 2	None	None
<b>Exam Week</b>	Dec. 13	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](mailto: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 and Quizzes (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 (30%) and Exam 2 (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 at a time during the week that you will be able to schedule through HonorLock (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 covers a large amount of material in a short amount of time. The group and class activities depend on the active and timely participation of all students. Therefore, **late assignments or quizzes will not be accepted** without an excused absence.

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

(On-Campus) Class attendance is expected. If you need to miss a class session, please notify the instructor in advance.

Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations/#text>). Additional information can be found here: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

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## 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/>.

### **Policy Related to Guests Attending Class**

Only registered students are permitted to attend class. However, we recognize that students who are caretakers may face occasional unexpected challenges creating attendance barriers. Therefore, by exception, a department chair or his or her designee (e.g., instructors) may grant a student permission to bring a guest(s) for a total of two class sessions per semester. This is two sessions total across all courses. No further extensions will be granted. Please note that guests are not permitted to attend either cadaver or wet labs. Students are responsible for course material regardless of attendance. For additional information, please review the Classroom Guests of Students policy in its entirety. Link to full policy: <http://facstaff.phhp.ufl.edu/services/resourceguide/getstarted.htm>

### **Recording Within the Course**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

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## **SUPPORT SERVICES**

### **Accommodations for Students with Disabilities**

If you require classroom accommodation because of a disability, it is strongly recommended you register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class or as soon as you believe you might be eligible for accommodations. 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 do this as soon as possible after you receive the letter. Students with disabilities should follow this procedure as early as possible in the semester. 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.
- **U 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>
- **University Police Department:** [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- **UF Health Shands Emergency Room / Trauma Center:** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

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.

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## 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](http://www.multicultural.ufl.edu).